Contemporary Design as a Tool for Cultural Preservation

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We certify that we have read this D.Arch. project and that, in our opinion, it is satisfactory in scope and quality as a D.Arch. project for the degree of Doctor of Architecture in the School of Architecture, University of Hawai'i at Mānoa.

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Chapter 1 | Project Abstract

1.1 PRESERVING TRADITIONAL CULTURES

The purpose of this project is to create and implement a methodology for using contemporary architectural design as a tool for the preservation of a traditional culture. The term "traditional culture" as used in this project refers to a culture as it existed before being greatly affected or influenced by an outside culture. The Wampanoag Native American tribe provides a good example for demonstrating this term. This tribe, located in what is now considered New England in the northeast United States, had an independently thriving culture up until the early 17th Century when the Pilgrims arrived from Europe. Before this time, the tribe had interactions with other Native American tribes, but the interactions did not drastically change their own culture. However when the European settlers arrived, the Wampanoag culture was affected in a way that greatly changed the peoples' lives, thus transforming their culture. Although the Wampanoag culture is still a living culture today, the traditional culture is the one which existed up until the arrival of the Pilgrims.

The next term to be defined is "cultural preservation." To preserve a culture is to protect and promote all strands of existence that define a group of people and their traditional way of life. This is not to say that a traditional culture must be "dying" in order to be preserved. This may be possible, but it is more likely that the culture is just not thriving in the same manner as it was before the contact with the outside society at some point in its history. Preserving a culture, therefore, is promoting its continued existence so that information about it is not lost. Although this is an architectural project, it is not focused only on preserving traditional architecture and building methods. The project aims to use architectural design to preserve and promote a traditional culture as a whole.

Cultural preservation is important for several reasons. First of all, traditional cultures represent a way of life that existed over a long period of history. Understanding history is important to society as a whole in order to advance into the future and avoid repeating mistakes of the past. Secondly, cultural preservation is important for members of the culture, as understanding their ancestors' way of life gives people a personal connection to their past and an understanding of who they are and where they come from. This is a social and psychological comfort that is an important need of all human beings. Thirdly, cultural preservation is important because it honors human diversity. Many of the problems in today's world are the result on misunderstanding and intolerance for differing cultures. Honoring this diversity, rather than letting it be a divisive element of society, is taking a step towards making this world a better place for everyone.

1.2 PROJECT GOALS

There are two major goals of this project. The first goal is to create a methodology for using contemporary architectural design as a tool for cultural preservation. This methodology will be able to be applied towards any building type and any traditional culture. It will present a set of standards which can be applied to architectural design and act as a prescriptive formula for designing a building(s) and the site upon which it sits as a tool for cultural preservation. If the methodology is followed, the result will be a design which preserves traditional culture and promotes its continued existence.

The second goal of this project is to implement the methodology into an architectural design. A traditional culture and a design challenge were selected to

demonstrate the effectiveness of the methodology. For this implementation phase, a high school will be designed which acts as a tool for preserving traditional Hawaiian culture. Information about the traditional culture and the specifics of the design challenge will be addressed later in this project.

1.3 USING CONTEMPORARY DESIGN TO PRESERVE CULTURE

There are several reasons why contemporary architectural design could serve as a tool for cultural preservation. First, however, *contemporary design* should be defined. As used herein, *contemporary design* refers only to architectural design which takes place in the current period of time, and not to any particular style. *Contemporary* should not be interchanged with *modern*, as the latter term applies to the particular style of *modernism*, and is quite different from *contemporary*. Implied with the term *contemporary* is that current standards and technologies will be used so that the building and site are able to efficiently function in today's society, and are not simply a replication of the architecture which existed at some point in history.

Architecture has the ability to play an important role in the preservation of traditional cultures. First of all, everybody uses buildings, so using them as a tool in this mission is a way of reaching a large amount of people. Secondly, architecture is something that is experienced, and people tend to be affected the greatest through experiential situations. Thirdly, architecture is relatively long-lasting, so design decisions have the ability to affect many generations of people. Because of these reasons, architecture is a perfect tool for cultural preservation.

1.4 PROJECT PROCESS

A process for accomplishing the goals of this project is hereby being put forth. The different sections will sequentially follow the order in which they are described below.

Cultural Architecture Case Studies: In this section, two architectural projects will be examined and documented. Both projects will feature designs which, at least partially, act as a tool for cultural preservation. The two projects were designed by different architects, for different cultures, with two different building typologies.

Project Statement: The project statement is the section where the methodology for using contemporary design as a tool for cultural preservation will be described in detail. It will discuss what information needs to be learned about a traditional culture, how this information is to be learned, and strategies for appropriately implementing the culture into the design.

Hawaiian Cultural Research Documentation: Because the methodology is being implemented and proven using the Hawaiian culture as an example, much research about this particular culture is necessary. This section will document the aspects of traditional Hawaiian culture which are deemed necessary to learn about in the methodology.

Current Trends in High School Design Research Documentation: No responsible architect or designer can design a building without first having some understanding of

the building typology. Because this project will be implementing the methodology using a high school as its example, research about current trends in high school design is required. This section will document the research that was conducted about this topic.

Project Site Selection: This section will cover the process of selecting the high school complex and the site upon which it sits.

Program (Quantitative): A quantitative program will be derived based upon the functional needs of the existing school district, as well as any other space requirements that may be deemed necessary in order to appropriately implement the methodology. The program will not be qualitative, as this portion is essentially covered by the methodology.

Design Execution Documentation: This section will show how the Cultural Design Methodology can be applied to the design of a high school campus in Hawaii. It will not be a "completed" design, rather the framework of a conceptual design that demonstrates the effectiveness of the methodology being presented. This will be shown using architectural drawings and diagrams, as well as a written description.

Chapter 2 | Cultural Architecture Case Study 1
Alaska Native Medical Center

2.1 BULIDING INTRODUCTION

2.1.1 Alaska Native Medical Center

The Alaska Native Medical Center is a full service hospital in Anchorage, Alaska, that offers primary, tertiary, and acute care.[1] It is fully owned and operated by Alaskan tribes, and serves only Alaska Natives and American Indians who live in Alaska. In addition to being a hospital, it also serves as a community gathering place for those who live in Anchorage and others who are just passing through the area. ANMC also incorporates teaching facilities, housing for patients and their families, and a Center for Disease Control Arctic Investigations Lab. It was designed by NBBJ over a several year period and opened its doors for service in 1997.[2]

2.1.2 The Client

The client for this project was the Indian Health Service (IHS),[3] which is part of the United States Public Health Service (PHS). IHS is responsible for providing federal health services to American Indians and Alaska Natives. Their mission, however is to be more than just a health care provider, but to also be an advocate for "raising the physical, mental, social, and spiritual health of American Indians and Alaska Natives to the highest level."[4]

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[1] "About Alaska Native Medical Center." Alaska Native Medical Center Online. 2006. 17 February 2007. <http://www.anmc.org>

[2] Richard Dallam. Personal Interview. 15 February 2007.

[3] Indian Health Service Online. 2007. US Department of Health and Human Service. 17 February 2007. <http://www.ihs.gov>

[4] Ibid.

2.1.3 Basis for Design

On December 18, 1971, the Alaska Native Claims Settlement Act was signed into law by the United States Government.[5] This act, among many other things, provided the funding for the design and construction of ANMC.[6] There is much controversy about this act though, as opponents say that it has caused economic conflict, competition among tribes, and destruction of the environment.[7] On top of that, much of the promised money has never arrived. This case study will not take part in the debate surrounding this act of the United States congress, but simply mention that the subject of this case study, the ANMC, was funded by ANSCA.[8]

Because this was a federally funded project, there were very stringent design requirements. For example, there was a requirement that the area of every space in the final constructed building could not vary by more than ten percent of the programmed area, and the overall building area had to be exactly as programmed.[9] This is just one of many examples of the extremely specific requirements that had to be followed in order to receive the funding. As is the case with many federally funded projects, the detailed requirements often contradict requirements by other agencies, groups, or boards that also have jurisdiction over the project.[10] It is because of this that the hospital did not open until more than a quarter century after the act was initially passed. This is being

[5] "Alaska Native Claims Settlement Act." Wikipedia, The Free Encyclopedia. 15 February 2007. Wikimedia Foundation, Inc. 17 February 2007. <http://en.wikipedia.org/w/index.php?title=Alaska_Native_Claims_Settlement_Act&oldid=155411485>
[6] Ibid.
[7] Richard Dallam. Personal Interview. 15 February 2007.
[8] "Alaska Native Claims Settlement Act." Wikipedia, The Free Encyclopedia. 15 February 2007. Wikimedia Foundation, Inc. 17 February 2007. <http://en.wikipedia.org/w/index.php?title=Alaska_Native_Claims_Settlement_Act&oldid=155411485>
[9] Richard Dallam. Personal Interview. 15 February 2007.
[10] Ibid.

addressed only because the stringent requirements may have controlled many of the decisions that were made throughout the design process, and ultimately played a large role in shaping the final design of the building.

2.1.4 Importance of Culture

Only after all of the federal limitations were sorted through could the real design challenge be addressed, which was to create a contemporary hospital facility that reflects Alaska Native values and behaviors, and a place that they could call their own.[11] They did not want a hospital which would be a symbol of the American influence over their lives, but a building which would reflect their own cultural values. Ultimately, the goal was to not only provide a building, but to create an atmosphere for Alaska Native healing.[12]

2.2 ARCHITECT'S CULTURAL RESEARCH PROCESS

2.2.1 Purpose of Architect's Research

The architect for this project was Richard Dallam, who is a partner at NBBJ. In order to meet the needs of the Alaska Native people and design a hospital that they could truly call their own, he had to gain a good understanding of their culture.[13] Of most importance were the people and their day to day lives, the Native building traditions, and other aspects of the culture that carried a high level of significance. Several different research methods were employed to gain this information, and they are explained below.

[11] Richard Dallam. Personal Interview. 15 February 2007.
[12] Ibid.
[13] Ibid.

2.2.2 Existing Literature / Written Materials

Before doing any field research, the architect felt that it was important to learn as much as possible from existing written materials.[14] There were two books he read which are about the people, their beliefs and values, and how they lived. The first of these is called "Crossroads of Continents: Cultures of Siberia and Alaska" by William W. Fitzhugh. This book has a very in depth analysis of the cultures of the Native peoples and their beliefs and values, focusing on the historical context. The second book is titled "People of the Ice and Snow," which is a publican of Time-Life Books. This book has a more detailed account of how people live their lives on a daily basis. Although it mentions much about the history of the people, it also talks about how people live their lives today and how it has changed over time.

It was also important to learn about the building traditions.[15] The architect found the book "Native American Architecture" by Peter Nabokov to be of great help on this topic. Although the book doesn't specifically focus on Alaska Native Architecture, there is a great deal of information found on this topic in the book. Another book, titled "Alakshak: The Great Country" by Art Wolfe, provided much information about the Alaskan Land. Not only does this book talk about the land and climate of Alaska, it also discusses the importance of the land to the Alaska Natives. There were other written materials which were ready by the architect, but these are the four books which were found to be most helpful, and the ones that were use as references throughout the project.

[14] Richard Dallam. Personal Interview. 15 February 2007.
[15] Ibid.

2.2.3 Elder Based Cultural Design Committee

As is the case with many cultures around the world, the elders are highly respected in the Alaska Native community.[16] They are seen as the keepers and spreaders of culture and knowledge. They are the ones who have been around the longest and seen the most. They would be able to give input into the design of the hospital that someone who is an outsider to the culture would not have otherwise understood. The architect wished to involve these elders in the design process, so an elder based cultural design committee was formed (*figure 1*). Because there are such a large number of different Native cultures in Alaska, the committee consisted of an elder representative from twelve different major groups of people. The committee would come to play a very large role in the design of the building.[17]

2.2.4 Extended Visits to Native Villages

One cannot fully understand any culture simply by reading books and having it explained to them.[18] A culture is something that needs to be experienced. For this reason, the architect made several extended visits to remote villages in Alaska. A total time of seven or eight weeks was spent in these villages, with the longest stay at any one place being over three weeks. During this time, he was fully immersed in their culture – eating, working, sleeping, and playing just as the Alaska Natives did (*figure 2)*. By living in the extremely harsh conditions and seeing how these people live their lives one day at a time, he began to directly understand the culture for the first time. These

[16] Vivian Eschevarria. Personal Interview. 22 March 2007.
[17] Richard Dallam. Personal Interview. 22 March 2007.
[18] Richard Dallam. Personal Interview. 22 March 2007.

visits were the most important part of the research process, and it would be imperative that the knowledge gained on the trips have an immense impact on the design.

2.3 INFORMATION LEARNED ABOUT THE CULTURE

2.3.1 Diverse Group of People

Throughout history, Alaska has played a very important role in the populating of the Americas.[19] Most scientists believe that groups of people began migrating to the American land mass across the Bering Strait during the last ice age when sea levels were much lower. This means that almost all native cultures in the Americas have an ancestral lineage that at some point or another came through Alaska. The migration did not occur at a singular point in history, either, as it is believed that there were several different major migrations. The result of this is a very diverse group of people who live, and have lived, in Alaska for the past many thousand years. Collectively, this group of people is known as Alaska Natives.

It is a common misconception that all Alaska Natives have a common racial and cultural identity.[20] This could not be further from the truth, however, as there are literally hundreds of different recognized groups of people. Many of these different groups of people are very similar, and are therefore usually subdivided into larger groups (*figure 3*). Even the number of these groups varies depending upon the resource, but thirteen seems to be a commonly used number. Thirteen major groups of people are much easier to intellectually comprehend than hundreds, but all thirteen are very distinct and

[19] "Human Migration and Local Knowledge." National Science Foundation Online. 2007. 25 March 2007. <http://www.nsf.gov/about/history/nsf0050/arctic/migration.htm>
[20] Vivian Eschevarria. Personal Interview. 22 March 2007.

different from each other. The Alaska Native Medical Center is to serve all of these different groups of people, and developing a common ground would be no easy task.[21]

2.3.2 Language/Communication

According to linguist Edward Sapir, "Language is not only a vehicle for the expression of thoughts, perceptions, sentiments, and values characteristic of a community; it also represents a fundamental expression of social identity."[22] Language is the single most important factor in uniting a culture. Words have meanings that cannot be properly translated to a language of a different culture, and so does the way in which words are put together and spoken. Culture revolves around communication that is commonly understood by a group of people. If a language falls out of use, much information about a culture is lost forever. Essentially, if a language dies, so does the culture.

The Native languages in Alaska have not dies and still remain widely in use (*figure 4*).[23] There was a period, however, when the use of the Native languages began to fade. This was during the time of the Bureau of Indian Affairs when there was a strong push by the United States government to force the American culture onto the Native peoples. All children were sent to boarding schools where they were forced to speak English, and the Native languages were strictly prohibited. It was also illegal to speak a language other than English before 6:00pm in their own homes. The elders retained the ability to speak their own languages, but the children, and the future of the

[21] Richard Dallam. Personal Interview. 15 February 2007.
[22] Kilgour, David. "The Importance of Language." Speech at Southern Alberta Heritage Langauge Association, Calgary. 9 October 1999. David-Kilgour.com. 25 March 2007. <http://www.david-kilgour.com/mp/sahla.htm>
[23] Richard Dallam. Personal Interview. 15 February 2007.

cultures, were losing this precious knowledge.[24] This changed when the United States government signed the Alaska Native Claims Settlement Act into law. Among many other things, this act allowed for the funding of schools in the Native villages.[25] Today, most children learn their Native language in these schools in addition to English. It is not a perfect scenario, but it has resulted in the restoration of the use of the Native languages, which has in turn kept the culture alive.[26]

Non-verbal communication is also a very important part of the culture.[27] At one of the first meetings with the group of elders, the architect wished to create an open forum where he could present his ideas and get more ideas from the elders. As he presented his material, he realized that it was not being well-received and there was almost no involvement in the conversation by the committee. After the meeting, he was told that his method of presentation was seen as disrespectful. In the Native culture, it was not proper to stand up in front of a group of elders, placing yourself above their level. It was also disrespectful to look them directly in the eye when speaking. On top of this, the group did not understand the drawings and presentation materials that were being used. Upon learning this, the architect realized that in order to learn from the committee, he would have to change his entire method of communication. That very night, he and his team went to work and built a model to show their ideas. The next morning, the committee was reassembled. This time, he had the group sit together on the floor. He presented the model while sitting amongst the elders, meanwhile never making eye contact (*figure 5)*. Not only did the committee have a better idea of what he was explaining because of the model, but they could also see that he truly wanted to

[24] Richard Dallam. Personal Interview. 15 February 2007.
[25] "Alaska Native Claims Settlement Act." Wikipedia, The Free Encyclopedia. 15 February 2007. Wikimedia Foundation, Inc. 17 February 2007. <http://en.wikipedia.org/w/index.php?title=Alaska_Native_Claims_Settlement_Act&oldid=155411485>
[26] Richard Dallam. Personal Interview. 15 February 2007.
[27] Ibid.

understand their culture. This opened the lines of communication, and the committee became an excellent resource of information throughout the rest of the project. This example demonstrates the importance of all forms of communication to the culture.

2.3.3 Subsistence Culture

A subsistence culture is a culture in which a group of people lives completely off the land.[28] Wealth is measured in terms of natural resources and currency has no meaning. Everything that is required for food, shelter, and clothing is either hunted or grown. There is a rarely a surplus of resources, and the people must live day-to-day, and season-to-season. There are three basic types of subsistence cultures. The first of these is cultivation, where food is grown and harvested on a seasonal basis. The second type is pastoralism, which is the raising of grazing animals. The third type is foraging, which is also known as hunting and gathering.

The traditional culture of the Alaska Natives falls under the hunting and gathering category (*figures 6-8*).[29] Because Alaska occupies such a vast amount of territory, different types of hunting and gathering cultures exist.[30] In the extremely harsh conditions to the far north, there is almost no vegetation that is useful to humans. In these areas, the survival of the people depended almost completely upon the success of hunting. Animals provided the people with both food and clothing, and in many cases shelter as well. In areas where the climate is a bit more temperate, there was a balance

[28] "List of Subsistence Techniques." Wikipedia, The Free Encyclopedia. 15 March 2007. Wikimedia Foundation, Inc. 25 March 2007. <http://en.wikipedia.org/w/index.php?title=List_of_subsistence_techniques&oldid=153968597>

[29] Richard Dallam. Personal Interview. 15 February 2007.

[30] Ibid.

between hunting of animals and gathering of plants and vegetation. Nowhere in Alaska, though, was there traditionally any type of cultivation of pastoralism.

This way of subsistence living has a very profound effect on the way in which people live.[31] Their survival is completely dependent on the land, water, flora, and fauna. As a result, Alaska Natives are a people with a very deep respect for nature.[32] They also have a deep love for their fellow mankind, and place an extremely high value on the ideas of family and community. This belief can be summed up with the concept of the circle of life. The architect of this project described this concept in terms of the shared values of the people which stretches across the borders of tribal boundaries.[33] He describes these values as "a respect for and balance with nature, a respect for elders, a respect for others, a love of children, sharing, cooperation, hunter success, domestic skills, spirituality, hard work, humor, humility, and the avoidance of conflict, a knowledge of family roles, a knowledge of their family tree, and a responsibility to their settlement."[34] This is a long description, but every one of these points represents a cultural value that has been shaped by the subsistence lifestyle.

2.3.4 Symbiotic Relationships

Men and women each have their own role in the traditional lives of Alaska Natives.[35] Men are the hunters. The animals they hunt will not only provide food, but also the bones and hides that are used for tools, clothing, and shelter. Women take on the domestic role. They care for the household and the children, and are also responsible for the cooking and sewing. Neither role is seen as more important that the

[31] Richard Dallam. Personal Interview. 15 February 2007.
[32] Vivian Eschevarria. Personal Interview. 22 March 2007.
[33] Richard Dallam. Personal Interview. 15 February 2007.
[34] Ibid.
[35] Ibid.

other; both are completely reliant upon the other for survival. To demonstrate this point, the architect told a story about a husband and wife he stayed within the remote village of Huslia in central Alaska (*figure 9*). The man would go out hunting during the day in the extremely harsh conditions. The combination of the wet snow and ice with the dreadfully cold temperatures could lead to death if he was not properly equipped. He relied on his wife to sew his clothes and make them water tight. If they were not, he would die. His life was in her hands every day when he left the house. The woman was also relying on her husband to bring home food for her every day. If he was an unsuccessful hunter, she would probably die. There is a mutual trust and respect between them, knowing that neither one of them would be alive without the other. This symbiotic relationship is the foundation of every Alaska Native family (*figure 10*).

2.3.5 Traditional Buildings

There are many different types of traditional buildings that were used by the Alaska Natives.[36] There are so many different groups of people, and most of them have their own unique set of building traditions. There are some common threads, however, that connect the buildings from the different cultures. Although there are hundreds of different pieces and parts of a building and almost as many functions and uses, the architect chose to focus on the aspects of the buildings that were most telling of the culture.

One of the common traits of buildings between cultures is the seasonal nature of the building.[37] Because the people lived subsistence lifestyles that relied upon nature, they would have to pick up and move along with the food. They are not nomadic people

[36] Richard Dallam. Personal Interview. 15 February 2007.
[37] Ibid.

who never settled into a permanent home; rather they would create a series of seasonal homes where they would live during certain times of the year. In some cases, a building's frame would be built out of large timbers. The covering would be made of stretched animal hides. When it was time to move on to a new location, the timber frame would be left in place and they would take the hides and all of the other interior furnishings with them (*figure 11*). The building frame would then be there right where they left it when they came back the following year. When American explorers saw this, they assumed that the buildings were old and abandoned, but the reality is that they were just not in use at the time. Not all Alaska Native peoples built their homes in this manner, but the seasonal nature of the home is a theme that seems to run throughout.

Another unique feature of the Native buildings was the entrance (*figure12*).[38] Alaska Natives have developed a rather sophisticated method of keeping the cold air out of their buildings. The first part of this was the depressed entryway. Just inside the entrance, the floor would be lowered well below the level of the rest of the interior space. As warm air rises, the cold air drops. This depressed entry created a cold air sink that would trap the cold air as soon as it came through the door. Another unique aspect of the entry was the large spatial volume. By creating a large volume inside of the relatively small entrance opening, the velocity of the incoming air would he dissipated so that it couldn't reach the main dwelling space. Another innovation with the building entrance was the non-linear form. The entrance would either be curved or zigzag in a manner that wouldn't allow for a direct path for the wind. The opening was also situated so that it would be facing away from the prevailing winds. The result of combining all of these innovations was a building entrance that was very efficient at keeping the cold air away from the people inside.

[38] Richard Dallam. Personal Interview. 15 February 2007.

The presence of large constructed gathering spaces is another commonality between the diverse cultures.[39] Most of the different communities of people would have large spaces where people could get together and talk (*figure 13*). These spaces are used for both socializing and making important decisions that will affect the community. For many of the cultures, these gathering spaces are centrally focused. For example, the Aleut *Barbara,* the Eskimo *kashim*, and the Athabascan community hall all have center oriented geometries. There are a few places, however, that used a longhouse as their gathering space, which has a much different geometry. Nevertheless, almost every community has some sort of central gathering area.

Materiality of the buildings is something that varied from place to place.[40] In areas where large trees were available, timber structures were usually erected. As mentioned previously, these timbers would often be covered with stretched animal hides (*figure 14*). The coverings may also be covered with other forms of vegetation, such as branches, pine boughs, and ground coverings. Further to the north, large trees aren't always available. The extreme conditions of the harsh cold and lack of winter sun doesn't allow for large trees to grow. In these places, the buildings were often made out of ice and snow. In this case, the interior of the dwelling area would often be lined with hides to help keep in the heat. Whatever the materiality, however, the forms and features are remarkably similar from one culture to the next all across Alaska.

2.3.6 Other Important Aspects of the Culture

There are several more common links between the different Alaskan cultures that have not been mentioned. What the architect saw as the most significant aspects of the

[39] Richard Dallam. Personal Interview. 15 February 2007.
[40] Ibid.

culture are discussed above, but there are several more unique things that he thought may be important to the design of the buildings. One of these important aspects of culture is their navigation methodology. As is the case with many subsistence cultures, the Alaska Natives have learned to read the sun, stars, and other natural wonders in great detail.[41] They can read nature like a map and understand what it is telling them. One example of this comes from an individual in the Elder Based Cultural Design Committee. He brought in a photograph of the mountains, and pointed out how the tone of the mountains gets lighter with passing distance. He said, "This is how we navigate." The atmospheric de-saturation of the color tone of the mountains, as well as the angle of the sun's reflection, told him everything he needed to know about distance and direction (*figure 15*). Meters, kilometers, and cardinal directions meant nothing.

Symbolism is also an important part of the Alaska Native culture.[42] What outsiders often don't realize is that there is an embedded meaning in everything. Patterns on clothing and household supplies were not randomly created to make the items look prettier. They have meaning that is deeply rooted in the culture (*figure 16*). The architect felt that it was not necessarily his place to understand exactly what they meant, but instead just to understand that they had a great meaning, and vary from one culture to the next.

Another of these important aspects of the culture is death.[43] Death is a huge part of these people's lives. They live with uncertainty on a daily basis. The climatic conditions are so harsh that one false move or one bad decision will be fatal (*figure 17*). Death is around them at all times, and they have learned to cope with it. They recognize the fragile nature of human existence and are very spiritual people. For this reason, the

[41] Richard Dallam. Personal Interview. 15 February 2007.
[42] Ibid.
[43] Ibid.

way that a person is treated in death, both mind and body, is a very important part of the culture.

2.3.7 Not Knowing Everything

The major aspects of the Alaska Native culture that have been discussed above, being the diversity of the people, the importance of language, the subsistence lifestyle, symbiotic relationships, and the traditional buildings, were seen by the architect as some of the most important parts of the culture.[44] However, a culture consists of everything that defines a group of people's lives. A culture is based on the combined past experiences and way of life for an entire group of people. It would be impossible for a non-native to fully understand the entire culture. In fact, trying to understand everything about a culture will only result in a watering-down of the big picture. The important part of the architect was not to understand every detail, but to find commonalities that link these people together. By doing so, the picture will hopefully be much clearer, and the information gathered will be much more useful.

2.4 INCORPORATION OF CULTURE INTO DESIGN

2.4.1 Subsistence Culture

2.4.1.1 Natural Lighting

Because Alaska Natives traditionally lived in a subsistence culture, their lives completely revolved around their relationship with nature. Because of this, the architect

[44] Richard Dallam. Personal Interview. 15 February 2007.

felt it was extremely important to reflect this relationship in the design of the building.[45] The first way of doing this was through the use of natural lighting. Hospitals are not typically known for their natural lighting, but this building breaks away from that trend.

There are times of the year when the days pass with very little or no sunlight because of Anchorage's latitude.[46] For this reason, large windows are used throughout the building to take full advantage of the sun's light during the times that it is available.[47] On the first and second floors, there are long corridors that transverse the entire length of the southern side of the building. With the low sun angles, natural light floods these spaces, even on cloudy days (*figure 18*). The circulation through the rest of the floor is through two major corridors which cross each other in the middle. Each end of these corridors terminates with large floor-to-ceiling windows which allow large amounts of light to enter into the common areas (*figure 19*). The footprint of the third through fifth floors is a bit smaller so there is no corridor along the southern side. However, there are still large windows at the end of the corridors. The largest gathering spaces are located where the corridor butts into the southern wall, creating a great opportunity for enormous windows and large amounts of light. Because of this layout, natural light can be seen from virtually every common space in the building.

There are interior spaces where the sun cannot sufficiently provide enough light due to the building's large size. Also, between dusk and dawn, and during the months where the days are very short, natural light can obviously not be depended on. Rather than using typical lighting methods, natural light is mimicked through the use of indirect lighting.[48] Cove lighting is used in the corridors to splash light on to the walls. Unique wall sconces were also designed which are meant to be an interpretation of sun shining

[45] Richard Dallam. Personal Interview. 15 February 2007.
[46] Ibid.
[47] Ibid.
[48] Ibid.

through a layer of ice (*figure 20*). These indirect lighting techniques serve to soften the spaces, and give them a much more natural feel.

2.4.1.2 Visual Connection with Nature

Allowing visual connections with nature is another method that was used to reflect the subsistence culture of the Alaska Natives.[49] The large windows at the end of every corridor which allow light into the building also provide views of the great outdoors (*figure 21*). Spectacular views of the surrounding mountains' natural beauty can be seen from almost every common area in the building. Even in the center of the building where the corridors cross, views to the exterior are provided so that one would never feel lost or trapped in the middle of a large building. There are also seating areas at the end of the corridors to encourage people to enjoy the natural beauty.

Trees and other plants are located just outside of the windows on the ground level, allowing for a constant connection with nature (*figure 22*). Rather than providing clear views of a far-off nature, the landscaping makes one feel as though they are a part of nature. There are also small courtyards on the ground level that are filled with native plants. If walking down one particular corridor, trees can be seen on both the left and right at the same time, just an arm's reach away, making one forget that they are even in a hospital.

2.4.1.3 Use of Wood

Wood is used extensively as a material throughout the entire building, which is another method of representing the Alaska Native's relationship with nature (*figure 23*).[50] Upon entering the building's front entrance, the public lobby is the first space that is

[49] Richard Dallam. Personal Interview. 15 February 2007.
[50] Ibid.

seen. This is a round space with an elaborate system of large wooden structural members. Looking upwards, the dome-shaped ceiling has a wood finish. This same wood finish is used on the ceilings of all of the entrances to the building, as well as the central spaces where the corridors intersect. Wood is not only found in these select areas, but used throughout the entire building. Wooden chair rails are located on the walls of every corridor, the built-in furniture at the information desk and nurse stations are all made of wood, and all of the window frames and mullions are also made of wood (*figure 24*). Used as both a structural and finish material throughout, the use of wood is an effective way of warming up the spaces and reflecting upon the traditional subsistence culture.

2.4.1.4 Natural Color Palette

The color palette used for all of the interior finishes, in addition to the use of wood, is very natural in appearance. White is the primary color used for most of the wall and ceiling finishes. Although this may seem very simple, it is a reflection of the snow and ice covered landscape found in the area for a large portion of the year.[51] Muted gray and brown tones are used for wainscots and floor finishes. The combination of earth tones, white, and wood is a fairly accurate representation of the naturally occurring colors that are fond outside. Many of the color schemes were actually chosen based off of the photos that were provided by the Elder Based Cultural Design Committee. By keeping with this color palette, the building feels much more natural, and thus reflects the Alaska Native people's intimate relationship with nature (*figure 25*).

[51] Richard Dallam. Personal Interview. 15 February 2007.

2.4.2 Diversity of the People

2.4.2.1 Representation through Artwork

The artwork at the Alaska Native Medical Center is one of the most stunning features of the building (*figure 26*). What makes it special is the fact that it is all Native artwork. The artwork comes from every corner of Alaska, and all of the different groups of people are represented.[52] It is not exactly an equal representation, as some groups have more artwork displayed than others. This is not a result of favoritism, but simply a reflection of the collection that was available.[53]

Usually, artwork is not something that is considered part of the architecture, as it is typically added after the building has been designed. In this case, however, the artwork that was to go into the building had a large impact on the design, as spaces were specifically designed to display specific pieces of artwork.[54] On the ground floor, parts of the corridor are twelve feet wide, which allows for two feet of display cases on either side without cutting into the minimum required width of eight feet. In order to protect the display cases from being damaged or run in to, the walls periodically extend into the corridor to the eight foot mark. This forces people to walk down the eight foot center of the corridor, and is a way of visually separating the gallery space from the circulation area (*figure 27)*.

The central vertical circulation area is another place where the artwork shaped the design.[55] Knowing that many Alaska Natives prefer to use the stair instead of the elevator, the architect decided to use this heavily traveled space as a place for displaying artwork. As the stair winds its way up, it opens to the main elevator lobby at

[52] Jeanne Doughtery. Personal Interview. 22 March 2007.
[53] Ibid.
[54] Richard Dallam. Personal Interview. 15 February 2007.
[55] Ibid.

each floor. At each floor level, there is a large display case that is built into the wall opposite the elevators (*figure 28*). Each of these display cases are approximately twelve feet wide, seven feet tall, several feet deep, and full of Native artwork. Next to the display case is a description of the theme for that particular case, and also a list of what everything is, who made it, and where they are from. In the actual stairway, there are five small display cases between each level which are built into the wall, each containing artwork from various places around Alaska (*figure 29*). These measures that have been taken transform the usually meaningless activity of walking up a stairway into a trip through an art gallery.

Artwork is found in every corner and along every wall of the building. It is part of the building and was not simply added on by interior decorators after the architecture was completed. Every piece of art has a story behind it which tells something about the people of Alaska (*figure 30*). Because it is all very different and comes from every part of the Alaska, it is a true celebration of the diversity of the people.

2.4.2.2 Maps on Every Floor

On every floor of the hospital, a special place was reserved in the design for the hanging of a map of Alaska.[56] The maps depict the areas where different groups of people are located, geographic features such as mountains and rivers, and also the names of cities and villages. These maps are not hung as wall decoration, but are used as a way for patients to tell their story. When patients come to the hospital from different parts of Alaska, hospital staff will often ask them to point out on the map where they are from. Alaska Natives have a very strong connection with their history, ancestry, and culture, and are very proud of where they come from. There are a great many diverse cultures in Alaska, and these maps provide a way for people to tell their story about who

[56] Jeanne Doughtery. Personal Interview. 22 March 2007.

they are and where they come from. Because much of the staff is also Alaska Native, they have quite often come from the same places. Being able to tell these stories helps to make the relationship between staff and patient much more personal, which helps with the healing process.

2.4.3 Gathering Spaces

2.4.3.1 Family Values

Family is a very important part of the lives of Alaska Natives.[57] Traditionally, man and woman depended on each other for their survival. Although this symbiotic relationship may not be quite the same for most Alaskans today, the value that they place on family still exists.[58] Most also believe that an individual cannot heal on their own in a hospital, and that the whole family must be involved. This is one of the reasons that there are so many gathering spaces, large and small, scattered throughout the hospital.

The largest gathering space is the central lobby, located just inside the main entrance (*figure 31*). However, this lobby is not what is typically expected of a hospital lobby. In most Western cultures, people tend to stick to themselves in hospital waiting areas, usually sitting in a chair and staring at a TV or out the window. However, in the Alaskan culture, families and groups of people gather together.[59] In order to accommodate this, the lobby is set up in a circular format. There are two concentric circles of seating areas, allowing for easier interaction between people. There are no TVs, and the seating faces towards the center of the circle and away from the windows.

[57] Richard Dallam. Personal Interview. 15 February 2007.
[58] Ibid.
[59] Vivian Eschevarria. Personal Interview. 22 March 2007.

This layout allows for families to gather and engage on another while waiting for loved ones who may be patients somewhere in the hospital.

There are also many smaller gathering spaces allowing for different levels of privacy. At each end of the corridors on every floor, there are smaller gathering spaces (*figure 32*). At the east and west ends, the spaces are fairly small and can only accommodate a few people. The space at the south end on each floor is a bit larger, allowing for larger groups of people or several smaller groups. At the north end, there is a semi-private room with doors that close (although partially transparent to maintain path for natural light and views). All of these spaces feature great natural lighting and a visual connection with nature. There is also a small meditation space, which serves a similar function as the chapel in most American hospitals. This is a round space that can hold a moderately sized group of people or a few small groups. All of these different spaces were specifically designed to accommodate the family values of the Alaska Native people.[60]

2.4.3.2 Performances

In traditional Alaskan villages, people would often gather for musical or dancing performances.[61] Interestingly enough, the large central gathering space has taken on this function as well. Almost every day, somebody can be found performing here, whether they are singing, playing the guitar, performing traditional dance, or just about anything else.[62] Rather than gathering in these spaces to mourn, people come together to celebrate life. During my visit to the Alaska Native Medical Center, a man was playing the guitar and he and his wife were singing. Other people sitting around the circle were singing along, and a few small kids were dancing in the middle (*figure 33*). Between

[60] Richard Dallam. Personal Interview. 15 February 2007.
[61] Ibid.
[62] Vivian Eschevarria. Personal Interview. 22 March 2007.

songs, they were talking with each other and others around them. Then without notice, they would start playing and singing another song. At one point, a woman asked if they had a family member who was being treated at the hospital. The man said that he didn't know any patients in the hospital, and that they just liked to stop in from time to time and play music. Apparently, this happens almost every day. Basically, this gathering space provides a place for Alaska Natives to get together and meet others from the community.

2.4.3.3 Cultural Connections

At the building where the Alaska Native Medical Center was previously housed, Alaska Natives who were from out of town would frequently stop by when they were in Anchorage, regardless if they knew of anyone who was being treated at the hospital.[63] They would see if there was anyone there that they knew, or else just talk with people and make cultural connections. However, the building didn't have any gathering spaces to accommodate this activity, so it would become very overcrowded. These people would unintentionally get in the way of hospital operations, or else be forced outside into the cold. Knowing that this same phenomenon would happen at the new building, the architect made sure to design space for this to occur[64]. The large central gathering area is the main place where this happens. Now that this space has been provided, even more people come to the hospital. With the addition of the artwork and culture designed into the building, it serves somewhat like a cultural center where people come simply to make connections and network with others of Alaskan heritage.

[63] Vivian Eschevarria. Personal Interview. 22 March 2007.
[64] Richard Dallam. Personal Interview. 15 February 2007.

2.4.4 Navigation

2.4.4.1 Tonal Quality of Facades

The traditional way of determining distances is through the atmospheric de-saturation of the tonal quality of natural features.[65] One of the elders on the Cultural Design Committee pointed out in a photograph that distances were determined by looking at the tonal differences in objects. The further away something is, the lighter it will appear due to the amount of atmosphere between the viewer and the object. In the photograph, the mountains that were the closest were darkest in color, and the mountains that were furthest away had a much lighter tone (*figure 34*). This is represented on the facades of the Alaska Native Medical Center.[66] The main color of brick that is used remains the same throughout the building, but the patterns created by the accent color fade as they get further away. While they are a deep red color nearest to the viewer, the accent bricks fade to a light reddish-tan color at the points on the building furthest away (*figure 35*). This is possible because of the way the building is massive in the center and decreases in height towards the perimeter.

2.4.4.2 Way Finding

Many of the people who come to the building from small villages in remote areas of Alaska have never before been to a building this large.[67] To avoid confusion and make exterior way-finding easier, traditional building techniques were used.[68] Although varying from one region to the next, entrances to buildings were usually round in most Alaskan cultures. There are two major public entrances to the Alaska Native Medical

[65] Richard Dallam. Personal Interview. 15 February 2007.
[66] Ibid.
[67] Ibid.
[68] Ibid.

Center, both of which are round. By designing the entrances this way, it is a visual symbol telling visitors where to go (*figure 36*).

Interior way finding is based on traditional navigation techniques.[69] There is contemporary signage which directs visitors around the hospital, but it is easy to feel lost in a building of this scale when coming from a small remote village. Distance was traditionally measured by tonal qualities, but direction is determined by the sun and geographic features.[70] The long and straight corridors with their large windows at the terminating points make it possible to always navigate in a traditional manner. From almost any public space in the building, mountains and other physical features of the landscape can be seen (*figure 37*). This may not mean much to somebody who determines direction by cardinal points on a compass, but it is very valuable to somebody who determines direction by reading nature like a compass. Also, if the sun is shining bright enough to cast shadows, they will also give clues to direction. Although signage is located everywhere, these traditional navigation methods that were designed into the building prevent visitors from feeling lost inside the building.

2.4.5 Building Traditions

2.4.5.1 Arctic Entries

The entrances to the buildings presented a design challenge. A traditional door that opens right into the lobby would allow too much of the interior heat to escape. This is very inefficient in the cold climate, and also makes it difficult to keep a consistent temperature in the lobby space. Revolving doors are a common solution to this problem, but they do not work in a hospital setting because wheelchairs are very difficult to

[69] Richard Dallam. Personal Interview. 15 February 2007.
[70] Ibid.

maneuver through them and gurneys are impossible. In order to solve this problem, the architect used the traditional building method of the arctic entry.[71]

The entrances have their own dedicated space and are set apart from the main lobby (*figure 38*). This separate space acts as a buffer zone between the exterior and interior climates. The entrances also have high ceilings to create a larger volume of air, which dissipates the speed of incoming cold air. The most important element, though, is the indirect entrance. People coming through the entrance must move in a non-linear path, around a corner, to get to the lobby. Not only do people have to move in this manner, but the wind does as well. By combining these elements, most of the heat stays inside and the cold remains out. Even with the doors held wide open, the receptionist at the information desk right inside the entrance rarely feels a draft. The arctic entries have proven to be a great representation of culture, and also very functional.

2.4.5.2 Building Scale

Many of the visitors to the Alaska Native Medical Center have never been to a building this large.[72] Most buildings in the remote villages even today may only be a few rooms, and rarely over one story in height. The architect wished to keep this small scale at the exterior of the building to make the building feel much less massive. The "village" approach was used to create the appearance that the building is actually a series of much smaller buildings. All of the areas where a visitor would walk by from the time they enter the property until they are inside are only one or two stories in height, and then gets progressively taller towards the center of its mass. The result is a building that

[71] Richard Dallam. Personal Interview. 15 February 2007.
[72] Ibid.

appears much smaller than it really is upon approach, making it more comfortable for those visiting from small villages (*figure 39*).

2.4.5.3 Gathering Spaces

As previously mentioned, gathering spaces are culturally important from the contemporary standpoint of promoting family values and developing cultural connections, but they are also part of the building traditions of Alaska Natives.[73] Most traditional villages had some type of community gathering space for socializing and making important community decisions. In most Alaskan cultures, these spaces were centrally focused. These building traditions were incorporated into the design of this building. The central gathering space in the main lobby is circular in form, with most of the seating facing inward, and its function is really quite similar to what it would have been in a traditional village (*figure 40*). The meditation space is also circular in form. The smaller gathering spaces at the ends of the corridors to not have this shape, but the seating was arranged in a way to have the focus on the center. Although these spaces have contemporary cultural implications, their design is based on the building traditions of old.

2.4.5.4 Timber Structure

The structure of traditional Alaskan buildings could have been made from any variety of materials, but one of the most common is large wooden timbers. Because of the seasonal nature of many of the buildings, the timber structure would be left bare for parts of the year while the skin was packed up and taken with the moving people.[74] This aesthetic has been interpreted by the architect by using large wooden timbers for the

[73] Richard Dallam. Personal Interview. 15 February 2007.
[74] Ibid.

structure of the main gathering space (*figure 41*). The timbers are not just for looks as they are indeed the structural element that is supporting the roof of the space. Their form is much more elaborate than what would have been traditionally built, but their material and bareness in appearance is a visual representation of the traditional construction.[75]

2.4.5.5 Material Representations

There are a few areas where traditional building materials have been interpreted using contemporary materials and forms. One of these places is in the ceiling of the central gathering space. Most of the ceiling here is finished in wood, but there is a central oculus which acts as a skylight. A common material used in traditional construction was seal gut.[76] It was used because of its combined abilities to be flexible and water-repellent at the same time, which also made it a useful clothing material. It has a white color, but is translucent when held up to the light. The oculus in the ceiling of this gathering space seeks to reflect this building tradition by using translucent fiberglass.[77] It did not make sense to use the real material, as there are contemporary materials which serve the same function and work much better. The visual appearance of the fiberglass, however, is similar to what seal gut would have looked like if used in the same manner (*figure 42*).

Another place where a traditional material has been reinterpreted is in the structure of the canopies over the benches and walkway on the outside of the building.[78] In some of the photos brought to the architect by the Elder Based Cultural Design Committee, there were structures of whale bones sticking out of the ground and rising

[75] Richard Dallam. Personal Interview. 15 February 2007.
[76] Ibid.
[77] Ibid.
[78] Ibid.

into the air. As a contemporary interpretation of this image, the canopies were built of white steel members that rise into the air, well beyond the height of the canopy (*figure 43*). They are functional for their intended use, and at the same time reference cultural traditions.

Basket making was an important part of the culture for almost all Alaska Native groups of people.[79] Not only were the baskets functional objects, but they were considered forms of art. It took a lot of skill to create the baskets with their finely woven patterns and symbols. These patterns that were used are represented on the façade of the building through the use of brick patterns. However, it was very important that the architect not try to mimic any exact pattern, as not understanding its true meaning could result in a very offensive outcome. For this reason, the weaving patterns found in the brick are meant to be generic interpretations that only serve as a visual reference to the artwork (*figure 44*).

2.4.6 Circle of Life

2.4.6.1 Lobby Artwork

The circle of life is one of the central themes of the Alaska Native culture, as it shown by their family values and views on life and death.[80] The building is full of artwork, but there are very few pieces that were commissioned. Two of these works are in the central gathering space, and were commissioned to be interpretations of the circle of life. One of them is made from pieces of stone inlaid into the floor in the center of the gathering space (*figure 45*). It is circular in form and depicts a map of Alaska, the sun and some clouds, a rainbow, and several different animals. The other is a series of

[79] Richard Dallam. Personal Interview. 15 February 2007.
[80] Ibid.

geese, each made of bronze and hand-crafted, which circle around the entire space just above eye level (*figure 46*). Both works were created by Alaska Native artists and are representations of the meaning of the circle of life.

2.4.6.2 Body after Death

The lives of traditional Alaska Natives were always in danger due to the harsh climatic conditions, and death was a part of their daily lives.[81] Because of the way they lived, they have strong beliefs about death and how a body should be handled after a person has passed on. This had a large impact on the design of the building. Due to the functional nature of a hospital, people die inside of the Alaska Native Medical Center. What happens to their bodies after death was very important to the Cultural Design Committee. When a body is to leave the hospital, it has to move through a path and be handled in a way that is completely out of view. It also could not go through the loading dock, as this is where the trash is picked up. Because of this, a special route had to be planned, and a special place where bodies would be picked up had to be designed. This was not an easy task, however, and wound up having a fairly large impact on the design.

2.4.6.3 Passing of Traditions

Another important part of the circle of life is passing on the cultural traditions from generation to generations.[82] There are many different things about the design of the building that help to facilitate this act. Most of these have already been mentioned, such as the use of artwork, the incorporation of building traditions, and providing places to gather and spread the culture (*figure 47*). However, there are a few more ways that the building helps to pass on traditions that have not yet been mentioned.

[81] Richard Dallam. Personal Interview. 15 February 2007.
[82] Ibid.

One of the most important aspects of any culture is the language.[83] The death of a language will result in the death of a large portion of the culture. This building as a whole promotes the use of the Alaska Native languages. The main gathering space plays a large role in this. Because the hospital only serves those who have Alaska Native ancestry, the gathering spaces are filled with people who are Alaska Natives. It serves as a place for these people who come from the same or similar cultures to socialize and speak their native language. There are many different languages, but because of the large volume of people who gather here, there are many opportunities to speak their language and keep it alive.

Another way that the building promotes the passing of traditions is through its craft shop.[84] The shop is run by three women who have dedicated their lives to collecting and selling crafts and works of art from every region of Alaska (*figure 48*). These women have built relationships with artists and earned their trust.[85] Basically, the artists send their works to the craft shop at the hospital, either through mail or in person, and the craft shop prices and sells the items for them. They have a very small markup to pay for expenses, and do not take any of the proceeds for their own profit. Everything sold in the craft shop is completely authentic and hand-crafted by Alaska Natives. This craft shop is a great way to promote the Native crafts and pass them on to future generations. In the Alaska Native Medical Center's previous building, they did not have a space to run their store. All of the items were literally kept in a closet. The need for a dedicated space was recognized and designed into the building. The location and visibility of the craft shop, and the fact that it even exists, are examples of how the architecture itself is passing on the cultural traditions of the Alaska Native people, and contributing to the circle of life.

[83] Richard Dallam. Personal Interview. 15 February 2007.
[84] Ibid.
[85] Jeanne Doughtery. Personal Interview. 22 March 2007.

2.5 USER OPINIONS

2.5.1 User Opinions

Architects and designers often get caught up in "talk-itecture." Every decision that is made affecting the design is backed up by theory or conceptual reasoning, and the designer can explain the reason for every decision that was made. When analyzing a building designed by someone else, the same principles are applied in trying to figure out the reasons for their decisions. However, buildings may be designed *by* architects, but they are designed *for* a specific user group. Applying theory doesn't always mean that the building will be enjoyed by the people who actually use it. In order to learn if the building is actually successful, it seemed important to get the opinions of these people.

During a personal visit to the Alaska Native Medical Center, I interviewed as many people as possible to get their opinions. I spoke with members of the administration, human resources, maintenance, and nursing staff. I also spoke with visitors, some of which were there to see sick family members and some who only came to socialize in the gathering area. No current patients were spoken with in order to respect their individual privacy, but I was able to speak with people who previously been patients. Following is what these people have told be regarding their opinions about the design of the building.

2.5.2 Appropriateness of Design for the Culture

Everybody I spoke with was asked the question of whether or not they felt the design of the building is appropriate for the Alaska Native culture. Out of everybody that I talked to, not a single person said "no." There are a lot of buildings in Anchorage which

are not appropriate, and more than one person told me about their dislike for the performing arts building. The architect of this building tried to incorporate the Alaska Native culture into the design, but it has not been well-received. Pointing this out was a demonstration that the people I spoke with had strong opinions, meaning that their positive opinion about the Alaska Native Medical Center is a compliment to the appropriateness of its design for the culture.

People also told me why they felt it was important to have a building that was specifically designed for their culture. Over and over I heard people say, "This is *our* building." The Alaska Natives in the community feel very connected to the building, and take pride in the fact that it was built specifically for them. There is a strong resistance to the American culture, and people didn't want a hospital that only serves Alaska Natives to be symbol of the American influence over their lives.

2.5.3 Favorite Aspects of the Design

Everybody seems to have a different opinion when it comes to their favorite aspect of the design of the building. I noticed, though, that much of the staff kept mentioning the same thing, which was that the lighting was their favorite part of the building. They were in general extremely happy about the amount of natural light that the building receives, and how it improves their mood while working. They also liked the use of indirect lighting instead of the typical fluorescent fixtures found in most hospitals.

Among visitors to the Alaska Native Medical Center, I got a mixed response. A lot of people mentioned that the artwork was their favorite aspect of the building. One person told me that when she has visitors from out of town, she always takes them to the hospital to walk up the stairway and look at the art. In her own words, "Walking up the stairs from the lobby to the fifth floor is like going to a museum." Other visitors told

me that the large gathering space was their favorite part of the building. They described how it gives them a place to meet and talk with other Alaska Natives, and occasionally run into people they know. Two people I spoke with didn't even know anyone who was a patient, but just stopped in to socialize.

Both staff and visitors told me that one of their favorite aspects of the building is that it doesn't feel like a hospital. The atmosphere is very friendly and warm and doesn't feel like a place of sickness and death. They liked the fact that the whole building is carpeted and that there is wood on the walls and ceilings. Two staff members pointed out that it doesn't even smell like a hospital. All of this can be attributed to the incorporation of traditional culture into the design.

2.5.4 Least Favorite Aspect of Design

Most people didn't have too many negative comments about the building; however there are a few spaces that I got multiple negative comments about. The first of which is the meditation space. Although it is officially a non-denominational space, people say that it still feels like a Christian chapel. Although many contemporary Alaska Natives are Christian, a very large portion of them are not. They also said that the room is much too small, and cannot accommodate families of large groups of people. This is important to them, as family is always part of the healing process.

Another space that people don't like is the cafeteria. People say that it is too small and cannot accommodate enough people. This may not really be the architect's fault, however, due to the area restrictions placed upon the program. Beyond being too small, though, people don't like the way it is set up. All of the seating is designed for small groups of people. Again, they point out that Alaska Natives to not always come to the hospital by themselves or with only one or two others. When there is a serious

illness or injury, the entire family comes to the hospital. The cafeteria was not designed to accommodate this aspect of the culture.

2.5.5 Impact of the Design on People

I received varied responses when asking about the impact that the building has had on people, but they were all positive. A common reply was that the design of the building makes people more comfortable in coming to a hospital. Most people who are visiting a hospital are there under unfortunate circumstances, which means that the experience of being in a hospital is not always going to be a good one. However, by making the building a place that visitors can call their own, the experience can be softened a little and hopefully made more comfortable. This sentiment was echoed by the responses I received.

People also told me that the building makes it easier for their loved ones to heal. This is possible because there is space for families to get together and rally around those who are sick. The artwork, lighting, and relationship with nature make the experience much more spiritual, improving the possibility that healing will occur.

I was also told that the building has helped people to renew their sense of pride in their heritage and culture. Everybody enjoys having this place that they can call their own. Because almost everyone there is Alaska Native, they get together and talk about their culture and speak their native languages with pride. Some of the hospital staff mentioned that they frequently see people gazing into the display cases with a smile on their face. I also witnessed this myself. When asking about their favorite aspects of the building, one woman was telling me about how much she loved the artwork. She then asked me to follow her up to the second floor. She pointed to one particular basket in the display case, and with a proud grin on her face she said, “My mother made that one.”

2.6 CASE STUDY SUMMARY

2.6.1 Summary

The Alaska Native Medical Center is a building that was designed with traditional culture at the forefront of the design process every step of the way. Before even picking up a pencil, the architect dedicated himself to learning about the culture and doing his best to truly understand what it meant to be an Alaska Native. He read books, performed interviews, and spent many weeks in remote Alaskan villages living a life of a traditional Alaska Native. Through this research, he was able to learn about the traditional culture and find ways of incorporating it into the design of the building. As a result, the building not only functions better than it would have without the use of culture, but it also serves as a tool for the preservation of the traditional Alaska Native culture.

2.7 CASE STUDY CITED FIGURES

Figure 1: Alaska Native elders formed the cultural design committee (photo by NBBJ)

Figure 2: Photograph taken during one of the village visits (photo by NBBJ)

Figure 3: Map showing location of different groups of Alaska Native people (http://www.uaf.edu/ces/ruraldevelopment/nrbopeople.html)

Figure 4: Map showing locations of different languages being spoken by Athabascan group of people (image from NBBJ)

Figure 5: Architect Richard Dallam giving presentation to Cultural Design Committee (photo by NBBJ)

Figure 6: Alaska Native ice fishing (photo by NBBJ)

Figure 7: Meat from a catch being cured on a traditional rack (photo by NBBJ)

Figure 8: Inupiat hunters hauling a seal across the ice (photo by NBBJ)

Figure 9: Alaska Native couple that hosted architect during village visit (photo by NBBJ)

Figure 10: Traditional Athabascan family (http://images.google.com/imgres?imgurl=http://vilda.alaska.edu/)

Figure 11: Timber Frame of seasonal Alaskan building (photo by NBBJ)

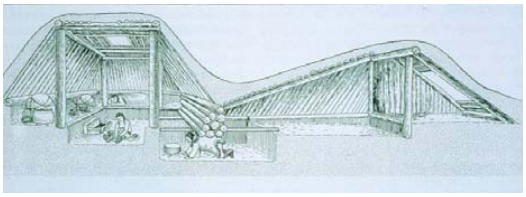

Figure 12: Diagram of an arctic entry (image from NBBJ)

Figure 13: Village gathering in an outdoor space (photo from NBBJ)

Figure 14: Examples of some typical building materials (image from NBBJ)

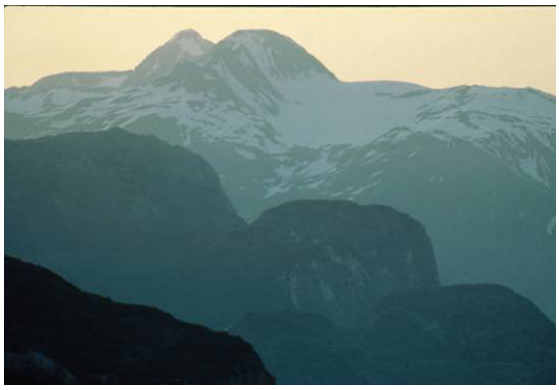

Figure 15: Atmospheric desaturation of mountains (image from NBBJ)

Figure 16: Examples of various patterns found on Alaska Native baskets (photo by author)

Figure 17: Alaska Native braving harsh conditions while fishing (photo by NBBJ)

Figure 18: Sunlight entering corridor along southern side of the ANMC (photo by author)

Figure 19: Sunlight entering fifth floor gathering space (photo by author)

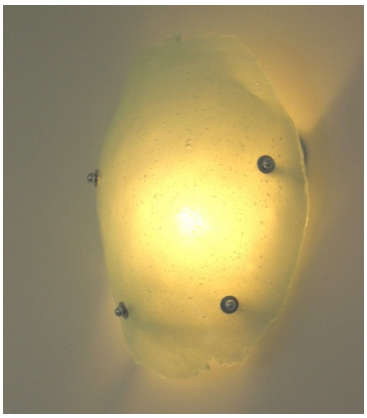

Figure 20: Wall sconce designed to resemble sun shining through ice (photo by author)

Figure 21: View of mountains through window at end of corridor (photo by author)

Figure 22: Trees and other plants located outside of windows (photo by author)

Figure 23: Wood ceilings at eastern building entrance (photo by author)

Figure 24: Wood used for many different applications (photo by author)

Figure 25: Color palette of natural hues (photo by author)

Figure 26: Sculpture located in the third floor gathering space (photo by author)

Figure 27: Corridor designed to accommodate display cases (photo by author)

Figure 28: Large display cases at vertical circulation core (photo by author)

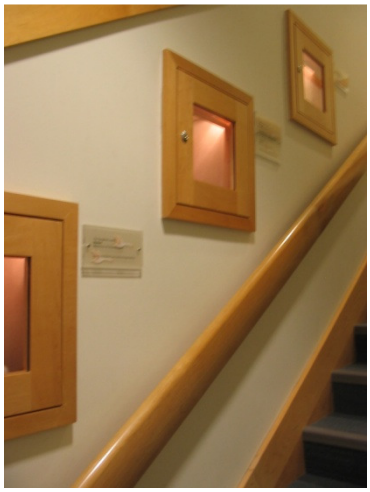

Figure 29: Small display cases in stairwell (photo by author)

Figure 30: Another example of artwork on display (photo by author)

Figure 31: Activity in the central gathering space (photo by NBBJ)

Figure 32: One of the smaller gathering spaces in use (photo by NBBJ)

Figure 33: Husband and wife playing music and singing in central gathering space (photo by author)

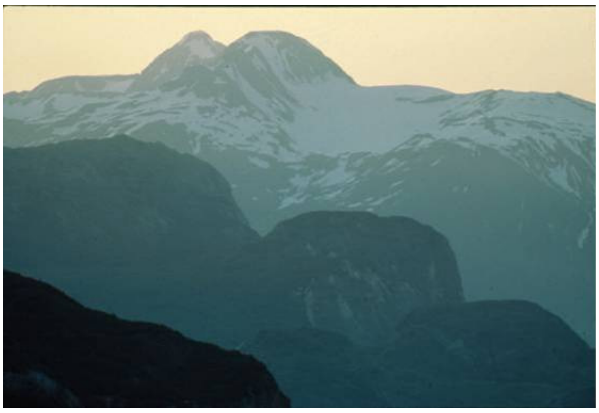

Figure 34: Atmospheric desaturation of mountains (photo from NBBJ)

Figure 35: Atmospheric desaturation represented through accent color on façade (photo by author)

Figure 36: Round area signifies an entrance point (photo by author)

Figure 37: Eastern view of mountains at end of corridor (photo by author)

Figure 38: Arctic entry at ANMC main entrance (photo by author)

Figure 39: Building scale is much smaller at perimeter (photo by author)

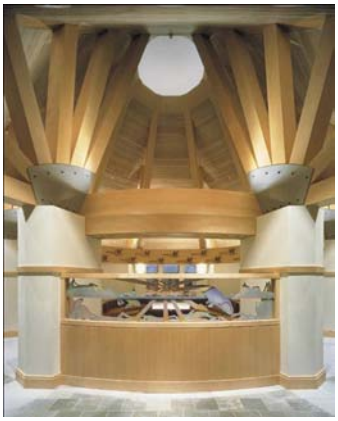

Figure 40: Circular gathering space inside main entrance (photo by NBBJ)

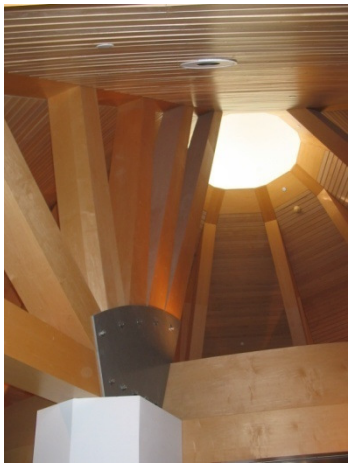

Figure 41: Wooden structural members in central gathering space (photo by author)

Figure 42: Translucent skylight at central gathering space (photo by author)

Figure 43: Canopy structure representing traditional whale bone structures (photo by author)

Figure 44: Weaving brick patterns used on exterior facades (photo by author)

Figure 45: “Circle of Life” mural on lobby floor (photo by NBBJ)

Figure 46: Bronze geese sculpture in central gathering space (photo by author)

Figure 47: Artwork in one of the large display cases (photo by author)

Figure 48: Women in charge of the craft shop (photo by NBBJ)

Chapter 3 | Cultural Architecture Case Study 2
National Museum of the American Indian

3.1 BUILDING INTRODUCTION

3.1.2 National Museum of the American Indian

The National Museum of the American Indian is a museum and cultural center dedicated to both the history and living culture of American Indian people (*figure 1*).[86] The purpose of the museum is "communication of culture through exhibitions, educational outreach, performances of music and dance, films, and other events".[87] It is located on a 4.25-acre site on the eastern end of the National Mall in Washington, D.C., east of the National Space Museum and south of the U.S. Capitol.[88]

3.1.3 Design Team

The original conceptual design of the building was conceived by Douglas Cardinal, an architect and a person of Blackfeet American Indian heritage.[89] Other project designers were Johnpaul Jones, who is a Choctaw and Cherokee American Indian, Ramona Sakiestewa, a Hopi, and Donna House, a Navajo and Oneida.[90]

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[86] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[87] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>

[88] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[89] "National Museum of the American Indian." Wikipedia, The Free Encyclopedia. 9 Aug 2007. Wikimedia Foundation, Inc. 11 Sep 2007 <http://en.wikipedia.org/w/index.php?title=National_Museum_of_the_American_Indian&oldid=150272334>.

[90] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007.

However, after disagreements early on in the process, Douglas Cardinal removed himself from the project.[91] At this time, Johnpaul Jones and his firm, Jones and Jones Architects and Landscape Architects, were named the new project architects (*figure 2*). Sakiestewa and House maintained an active role in the project serving as part of the design team. Also involved was the Native American Design Collaborative, The SmithGroup, and Polshek Partnership Architects. As a whole, the group worked collaboratively over a 15 year process from conception to construction to design the building the way it is seen today.[92]

3.1.4 Basis for Design

At the beginning of the 20th century, George Gustav Heye (*figure* 3) started his collection of American Indian objects and artifacts.[93] He was very wealthy and was able to purchase or trade for an exurbanite amount of American Indian goods. He continued collecting for the next fifty years, and eventually wound up with a collection of about 800,000 objects (*figure 4*). [94] Eventually, his entire collection was transferred to the Smithsonian Institution with the condition that new facilities be built to house this massive collection (*figure 5*). The National Museum of the American Indian in Washington, D.C. is one of three said facilities that were built for this purpose.[95] The

<http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[91] "National Museum of the American Indian." Wikipedia, The Free Encyclopedia. 9 Aug 2007. Wikimedia Foundation, Inc. 11 Sep 2007 <http://en.wikipedia.org/w/index.php?title=National_Museum_of_the_American_Indian&oldid=150272334>.

[92] Johnpaul Jones. Personal Interview. 11 April 2007.

[93] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[94] Ibid.

[95] Ibid.

U.S. government passed legislation on 28 November 1989 which authorized the design and construction of these facilities.[96] The formerly private collection of George Gustav Heye, along with the legislation passed, combined to form the basis for the design of the National Museum of the American Indian.

3.2 ARCHITECT'S CULTURAL RESEARCH PROCESS

3.2.1 Personal Knowledge

The project architect for the National Museum of the American Indian was Johnpaul Jones of Jones and Jones Architects and Landscape Architects.[97] Despite the traditional catholic name, Johnpaul is a Choctaw and Cherokee American Indian.[98] He grew up in a family that did not necessarily follow his cultural heritage practice, but he was always interested in his culture. As he grew older, he learned more about his Choctaw and Cherokee roots, and he also began learning about other American Indian cultures. Throughout his life he has continually learned more about traditional culture, eventually becoming somewhat of a spokesman for American Indian culture, especially within the architecture community.[99] The point is that, unlike many other architects who are designing buildings for a specific culture, he did not have to do as much specific cultural research because of his knowledge through personal heritage and life experiences.

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[96] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[97] "National Museum of the American Indian." Wikipedia, The Free Encyclopedia. 9 Aug 2007. Wikimedia Foundation, Inc. 11 Sep 2007 <http://en.wikipedia.org/w/index.php?title=National_Museum_of_the_American_Indian&oldid=150272334>.

[98] Johnpaul Jones. Personal Interview. 11 April 2007.

[99] Ibid.

3.2.2 Previous Professional Experience

Jones and Jones architects, the firm of which Johnpaul Jones is a partner, has designed several buildings, landscapes, and environments for various projects which were to be built specifically for an American Indian culture.[100] Some of these projects include the Aqua Caliente Cultural Center in Palm Springs, California, the Many Nations Longhouse at the University of Oregon (*figure 6*), and the Zuni Ashiwi Cultural Complex in the Zuni River Valley in New Mexico. Because they had previous experience in this type of architecture before designing the National Museum of the American Indian, they already had a great deal of knowledge about the traditional American Indian cultures.

3.2.3 Conversations with Elders

Although the project architect already had a wealth of knowledge about the American Indian cultures before beginning the design process, there was still a certain amount of research that had to be done before beginning the design of the National Museum of the American Indian.[101] Instead of forcing his personal views about the culture onto the people, he wanted to get opinions from the elders of American Indian groups of people from all throughout the Americas. For this reason, over 2 dozen consultations were held throughout the United States and Canada with American Indian Elders.[102] At these consultations, there were also representatives from Central and South American cultures. The people who attended were mostly natives, and also

[100] Johnpaul Jones. Personal Interview. 11 April 2007.
[101] Ibid.
[102] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

included museum professionals, educators, native elders, native community and political leaders, and native artists.[103] This diversity of backgrounds and interests allowed the architect to gain a full understanding of what the American Indian Community desired in the design of this museum.

3.3 INFORMATION LEARNED ABOUT THE CULTURE

3.3.1 Diversity of the People

It is a common misconception that all American Indians share the same heritage and the same culture.[104] This misconception has been helped along by the many different TV shows and Western Movies of 20th century Hollywood that have depicted American Indians as savages who all rode on horseback with feather bandanas and killing buffalo with their bow and arrows. Obviously, most people are aware today that this is a very demeaning portrayal, and that this is not actually who the people were. However, many people still don't realize that there is a huge array of different American Indian cultures and that they are in fact not all one in the same.[105]

The National Museum of the American Indian is supposed to be representative of all of the traditional native cultures in the Americas.[106] Although its name indicates that it is a museum for American Indian peoples, it aims to serve as a museum and cultural

[103] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>
[104] Johnpaul Jones. Personal Interview. 11 April 2007.
[105] Ibid.
[106] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

center for all indigenous peoples of the Americas.[107] To the north, there are more than a dozen different major groups of people from the Alaska, and many more from Canadian lands. Traditional cultures from as far west as Hawaii and the entire western mainland United States are also represented. The extents of the museum's coverage reach south through Mexico and Central America all the way down to the great past civilizations in Peru and Chile. To the east, the tribes of Maryland and eastern Canada are also represented. Basically, the museum is representative of all of the indigenous civilizations that have existed in the Americas at some point in the past all the way through today.[108]

In all, there are over 35 million indigenous people in the Americas today.[109] Of these, only 3 million live within the United States and Canada.[110] The rest of these people live in Central and South America. These people come from a very large number of different traditional cultures – some estimate that there are many thousand different recognizable different groups of people.[111] There are over five hundred different recognized cultures within the United States alone.[112] This diversity within and between the American Indian cultures is an important identifier of the culture, as it makes will make it more of a challenge for the architect to find appropriate methods of incorporating the culture into the design.

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[107] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[108] Johnpaul Jones. Personal Interview. 11 April 2007.

[109] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[110] Johnpaul Jones. Personal Interview. 11 April 2007.

[111] Ibid.

[112] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

3.3.2 Scientific Knowledge of Celestial Bodies

American Indians had a very advanced knowledge of celestial bodies and their activities and events.[113] Many different American Indian societies had scientific knowledge that some believe may have been more advanced than some of their European counterparts at the same period of time.[114] Starting with the sun, many cultures had learned to very accurately track the sun's path over the course of time and understand its annual cycles. They were even able to chart the exact dates of the solstices and equinoxes. By using this information, they were able to create a remarkably accurate compass and chart the earth's cardinal directions. This was very important to a majority of American Indian cultures, as much of their lives revolved around theses solar cycles. The patterns told them when to plant and harvest crops and when the herds of animals would be migrating.[115] The daily rising of the sun also commonly held spiritual significance as a representation of the cycle of life. Many celebrations and festivities were based upon the activities of the sun.

American Indians also had a great scientific knowledge of other celestial bodies, such as the moon, the other planets, and the stars. There are numerous references from all over the Americas which describe and depict eight distinct phases of the moon. This knowledge also allowed them to predict future lunar phases. The stars and planets were also very well documented. They had a very keen sense of direction which was very much based upon the location of these celestial bodies during different seasons and times of the year. These recognized patterns were commonly used for navigation, and also held a lot of spiritual significance.

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[113] Johnpaul Jones. Personal Interview. 11 April 2007.
[114] Ibid.
[115] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

3.3.3 Importance of Land

Land, nature, and the environment were extremely important to all of the American Indian groups of people.[116] One of the most important aspects of nature in traditional cultures was the land upon which they lived. The land had an immense control over their day to day lives. The land shaped almost everything about the people, from what they ate, what they wore, and the buildings they lived in. There were many different types of landscapes and habitats where native groups of people traditionally lived, including dense hardwood forests, marshy freshwater wetlands, wide open prairies and meadows, and arid desert plateaus.[117] Each of these habitats had very unique characteristics with its own set of life-sustaining opportunities and life-endangering challenges. In each and every case though, the land on which the people lived dramatically controlled their lives.

Water was also a very important part of traditional American Indian lives. Most traditional civilizations were located at or near a major source of water.[118] Water is the sustainer of life, and a society and its people cannot function without it. Water was abundant in some areas, but in many other areas it was not. Because of this, the location of water sources quite often determined the location of communities and cities.[119]

The type of landscape and availability of water both impacted the type of food that the American Indians ate. In many instances, they were able to come up with rather ingenious agricultural methods that showed a great understanding of the land and how it

[116] Johnpaul Jones. Personal Interview. 11 April 2007.
[117] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>
[118] Johnpaul Jones. Personal Interview. 11 April 2007.
[119] Ibid.

supported vegetation. One example of this is the "Three Sisters" method of growing corn, beans, and squash in the same place.[120] The corn stalks provided a home for the beans to grow. The corn in turn provided the nitrogen necessary to keep the soil balanced. Squash grew on the ground, and its leafy vegetation provided mulch which kept the ground fertile. This is just one example, but there are many others that show how American Indians understood the land and used it to sustain their lives.

The environment was obviously critical to the survival of the traditional American Indian societies. Without properly managing the land and water resources, they would not have been able to survive. This was recognized by the different groups of people, and as a result they were very conscientious about how they treated the natural environment. Environmental sustainability in their building, growing, hunting, and water-use was not a technique, but simply a way of life.[121] The survival of their communities and cities relied upon their ability to be stewards of the natural environment.

3.3.4 Other Common Beliefs and Cultural Practices

In addition to the major themes of the diversity of the people, scientific knowledge, and the importance of the land, the architect has discovered other important aspects of American Indian cultures which he felt would play a significant role in the design of the museum and its grounds. These are all aspects of the culture that seemed to be rather common between the different groups of people, and most of them are related to beliefs and cultural practices.

[120] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>
[121] Johnpaul Jones. Personal Interview. 11 April 2007.

One of these common beliefs is that there is a spirit in all natural objects.[122] Not only do many American Indian cultures believe that living creatures have a spirit, but that every object, including natural features such as rocks and water also contain a spirit. All of these spirits have an effect on the humans who live in their presence.[123] It is a different way of thinking than most cultures with European and Asian origins, but it demonstrates the deep level of spirituality and reverence for the land.

Another common belief is in the symbolism of animals. The presence of animals always had meaning that was much more than surface deep.[124] For example, eagles and other soaring birds were often seen as signs of wisdom and courage, and their presence was usually an ominous situation.[125] Deer were often seen as family protectors, and their presence was comforting.[126] A coyote on the other hand is seen as mischievous and may be an omen that something bad is about to happen.[127] These are just three examples, but there are many more animals that had a common symbolism between cultures. This is a significant aspect of the American Indian cultures, as it plays a large role in their belief systems.[128]

Another common trait is a respect for the elders of the communities.[129] Although most contemporary American cultures maintain a similar respect even today, it was taken to a completely different level with traditional American Indian cultures (as is the case with many traditional cultures around the world). Elders are given respect and listened to for their experience and wisdom. What they say and do was commonly

[122] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>
[123] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[124] Johnpaul Jones. Personal Interview. 11 April 2007.
[125] Kiva Trading Company. "Kiva's American Indian Symbol Dictionary." KivaTrading.com. Publish Date Unknown. 14 September 2007. <http://www.kivatrading.com/symbol1.htm>
[126] Ibid.
[127] Ibid.
[128] Johnpaul Jones. Personal Interview. 11 April 2007.
[129] Ibid.

observed almost as law.[130] Because they have been around the longest and had more life experiences, their opinions were highly sought after. This practice was common amongst almost all American Indian cultures.

Another common cultural practice is that of formal storytelling.[131] Storytelling was performed as a means of passing on knowledge.[132] The stories may have to do with hunting, fishing, ancestors, growing crops, animal legends, and wars. Consistently across American Indian cultures, the stories were often metaphorical and told with the intent of teaching lessons. Because most societies did not have a formal written format to their language, these stories were a way of passing on traditions, culture, history, scientific knowledge, and general wisdom to younger generations. Quite often, the storytelling was performed at night under a star-lit or moon-lit sky, and usually in a specific location or type of location.[133] In the cultures of the Pacific Northwest, this place was typically a clearing in the forest. Other cultures would also have a special setting where this activity took place. However, regardless of the differences in physical setting, the act of storytelling was an important part of almost all American Indian cultures.

[130] Johnpaul Jones. Personal Interview. 11 April 2007.
[131] "Inside the Museum." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 15 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=visitor&third=insid>
[132] Johnpaul Jones. Personal Interview. 11 April 2007.
[133] "Inside the Museum." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 15 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=visitor&third=insid>

3.4 INCORPORATION OF CULTURE INTO DESIGN

3.4.1 Diversity of the People

3.4.1.1 Languages

Because there are such a vast number of different American Indian cultures, there are hundreds of different native languages that were spoken by American Indian people.[134] Language is extremely important to preserving a traditional culture, so the architect decided to incorporate this into the design.[135] It was decided that the best place to showcase the language was right upon first entering the building.

The architect thought that the best way to demonstrate the diversity of people and languages would be through a "Welcome Wall."[136] The Welcome Wall is a large 23-foot screen that is directly above the welcoming desk.[137] Projected onto the screen is the word "welcome" in over a hundred different native languages. Some languages are written in their own traditional method of writing, while others that were traditionally only spoken languages are written phonetically using the English alphabet.[138] This wall demonstrates to visitors immediately upon entering that there are a vast number of different and unique American Indian cultures and that the American Indians are not a singular group of people.

[134] Johnpaul Jones. Personal Interview. 11 April 2007.
[135] Ibid.
[136] Ibid.
[137] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[138] Johnpaul Jones. Personal Interview. 11 April 2007.

3.4.1.2 Grandfather Rocks

Although the American Indian cultures are vastly different, one of the commonalities across almost all tribes is the respect for the elders of the community.[139] It was important that this be represented in the building as a way of incorporating traditional culture, but it was also important from the standpoint that the American Indian community believed that having the blessing of the elders was critical to the success and good fortune of the museum. Because of this, the designers found a way to metaphorically incorporate the elders into the design of the museum. Surrounding the building on its exterior grounds are 40 large stones which represent the elders from the various cultures.[140] The rocks represent the elders in that they are the oldest part of the landscape and provide a permanent presence around the building.[141] They are seen as the earth's oldest memories. Although all of the rocks came from the same quarry and Quebec, they are said to represent the elders from all of the various cultures and communities. They are known as the "Grandfather Rocks (*figure 8*)."[142]

3.4.1.3 Cardinal Stones

There is a large central gathering space in the museum known as "The Potomac."[143] As part of the Potomac, a large compass is laid out on the floor which

[139] Johnpaul Jones. Personal Interview. 11 April 2007.
[140] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>
[141] Johnpaul Jones. Personal Interview. 11 April 2007
[142] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>
[143] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

points to the four cardinal directions.[144] As well as being a symbol of the American Indian knowledge of astronomy, it is also symbolic of the diversity of the people.[145] Large stones, known as the "Cardinal Stones," (*figure* 9) are used to point out the four cardinal directions on the compass.[146] These stones represent the far reaches of the American Indian people by physically coming from four different far-reaching corners of American Indian society. The stone which marks the western point on the compass came from Hawaii, the Western most in the Americas which was populated by an indigenous group of people. The north stone came from a historic Canadian site, the east stone from Maryland, and the south stone from Chile.[147] All of the places where the Cardinal Stones came from have a rich history of traditional culture, and thus the compass demonstrates the diversity of American Indian cultures.

3.4.1.4 Artifacts / Arts / Crafts

The diversity of the people is also shown through the various artifacts, arts, and crafts in the museum. The artifacts are obviously critical to the success of the building, as creating exhibits filled with artifacts was one of the most important reasons for designing the building in the first place.[148] The artifacts come from all different places that have been inhabited by American Indians either currently or at some point in the

[144] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[145] Johnpaul Jones. Personal Interview. 11 April 2007.

[146] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[147] Ibid.

[148] Green, Sara Jean. "Architect Helped Create a Place for Indians to Share Their Stories." The Seattle Times Online. 21 September 2004. 11 September 2007.

past. The uniqueness of each individual artifact show how greatly different and diverse the American Indian cultures were and still are (*figure 10-13*).

Artwork is also an important part of the museum's design, as there are many spaces designed to hold different types of American Indian artwork. One of which is a gallery that is completely dedicated to contemporary American Indian artwork which is based upon traditional culture.[149] Although the artwork is contemporary, it still demonstrates the cultural differences of the people. There is also a retail store within the museum which was designed as a place to sell this contemporary artwork.[150]

Traditional crafts also have a role in the building. One example comes from the walls of the Main Theater. The Main Theater itself is representational of traditional cultures in that many American Indian groups of people used clearings in the woods or forests as places for storytelling, and this theater is supposed to be a contemporary interpretation of that setting.[151] Part of this setting is the wall finish, which is made up of vertical planks of wood to represent the towering trees of a surrounding forest (*figure 14*).[152] The planks were all hand-carved with a traditional stone adze, giving them a rough textured finish with a slight sheen.[153] This was a craft of Northwest American Indians that took much time to learn and a lifetime to master. The craftsmen took great care in the carving of each individual plank, and thousands of person-hours went into the creation of the planks that line the Main Theater walls. This is just one example out of

[149] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[150] Adams, Jim. "National Museum of the American Indian Reviews: Ceremonies Were Nice But Critics Pan Content." Indian Country Today. 8 October 2004. 11 September 2007. <http://www.indiancountry.com/content.cfm?id=1096409661>

[151] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[152] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[153] Johnpaul Jones. Personal Interview. 11 April 2007.

many ways that traditional crafts were designed into the architecture of the building. These crafts, just like the artifacts and contemporary arts, show the diversity of the native peoples and cultures in the modern day Americas.

3.4.1.5 Food & Snacks

There are multiple snack shops and places to eat within the walls of the museum (*figure 15*). These places also show the diversity of the American Indian people by serving traditional foods that were grown, cultivated, and raised in the traditional cultures.[154] Foods such as corn and squash are served, some of which was grown in a traditional manner right on the property outside of the building.[155] Other foods such as salmon and buffalo that were staples of traditional diets in other native cultures are also served.[156] Food was an important part of the American Indian cultures for more than just nourishment, but the act of eating, sharing, and celebrating food were critical to the spiritual life of almost every community.[157] Some of these different ceremonies from various cultures are performed before food is served, again demonstrating American Indian cultural diversity.[158]

[154] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[155] Ibid.
[156] Creager, Ellen. "American Indian Museum Takes its Place on Mall." 26 September 2004. The Honolulu Advertiser Online. 15 September 2004. <http://the.honoluluadvertiser.com/article/2004/Sep/26/il/il09a.html>
[157] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[158] Johnpaul Jones. Personal Interview. 11 April 2007.

3.4.2 Solar Activity

3.4.2.1 East Orientation

American Indians had a great scientific knowledge of solar activity.[159] Throughout the Americas, different traditional cultures celebrated such events, one of which was the daily rising of the sun. The sun represented life, and thus Eastern orientations which celebrated the daily rising of the sun were commonly celebrated. For this reason, the building was designed to have an eastern orientation. The entrance to the museum faces due east, directly in line with the eastern cardinal direction.[160] By facing east, the building itself is welcoming the sun rise every morning, paying tribute and acknowledging the significance of this solar event.[161]

3.4.2.2 Potomac Compass

As stated previously, there is a large compass on the floor of the gathering space known as The Potomac (*figure 16*). The compass is essentially a shrine dedicated to the sun. American Indian knowledge of the cardinal directions derived from daily rise and fall of the sun and tracking its position over time.[162] This scientific knowledge resulted in a spiritual association with the sun, and thus the compass is a representation of this aspect of American Indian culture. The compass is given even more significance by the Cardinal Stones which mark each of the cardinal directions.[163] Beyond each

[159] Johnpaul Jones. Personal Interview. 11 April 2007.
[160] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>
[161] Johnpaul Jones. Personal Interview. 11 April 2007.
[162] Ibid.
[163] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007.

Cardinal Stone, there is a view to the exterior of the building, acknowledging the important relationship between the sun, nature, and ultimately life.[164]

In addition to mapping the cardinal directions, the compass also pays tribute to the American Indian knowledge of the solstices and equinoxes. There is a large oculus in center of the large dome of The Potomac, 120 feet above the ground (*figure 17*).[165] This oculus, in addition to creating a large quantity of natural light and providing a visual connection to the sky, casts a beam of light onto the compass on the floor below (*figure 18*).[166] There are markings on the floor, made up of rings of red and black inlaid granite,[167] which mark the points where the sun from the oculus will shine during the summer solstice and fall and spring equinoxes.[168] During the winter equinox, the sun angle is too low to shine through the oculus, but the charting of the other three solar events is a spectacular sight – one which draws in large crowds who come specifically to witness the event.[169] Because of this well-planned beam of light, the floor of The

<http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[164] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[165] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

[166] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[167] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[168] Green, Sara Jean. "Architect Helped Create a Place for Indians to Share Their Stories." The Seattle Times Online. 21 September 2004. 11 September 2007. <http://seattletimes.nwsource.com/html/localnews/2002041637_jonesprofile21m.html>

[169] Johnpaul Jones. Personal Interview. 11 April 2007.

Potomac essentially reads as a solar calendar[170] and a tribute to the spiritually associated with the sun that is a common trait among American Indian peoples.

3.4.2.3 Prisms

The importance of the sun in American Indian cultures is also incorporated into the design by using a series of large glass prisms to reflect and refract light into The Potomac.[171] In all, there are eight of these prisms in the south wall (*figure 19*). The location of each prism was scientifically calculated and designed to refract light into The Potomac during a specific time of day and specific time of year,[172] each of which was based upon important dates and times from different cultures. The result is a colorful tribute to the importance of the sun (*figure 20*).

3.4.3 Celestial Activity and Events

3.4.3.1 Astronomical Paving

In addition to knowledge of solar activity, most American Indian cultures also had a very extensive knowledge of celestial activity and viewed it with a certain amount of reverence.[173] This reverence to the stars was designed into the site of the building. At the south entrance to the building, there is a large exterior paved plaza (*figure 21*). The architect designed this space to be a map that plots the location of the stars and other

[170] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[171] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[172] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[173] Johnpaul Jones. Personal Interview. 11 April 2007.

celestial bodies on the specific day of 28 November 1989.[174] This is the day that legislation was passed approving the National Museum of the American Indian and providing partial funding for its design and construction. This was viewed as an extremely important date by the American Indian elders, as it was a date that helped in the process of preserving their traditional cultures.[175] At the center of the plaza is the pole star, Polaris, with all of the other celestial bodies radiating outward in their appropriate positions.[176] By plotting the heavens onto the paving pattern, the architect was recognizing the great celestial knowledge and understanding of traditional American Indian cultures, and at the same time paying tribute to an important date in the contemporary history of these cultures.

3.4.3.2 Celestial Dome

The dome at the center of The Potomac is also a representation of the American Indian knowledge of celestial events.[177] The dome when viewed from the ground is a metaphor for the heavens above (*figure 22*). The half-sphere shape of the dome is representative of the fact that the heavens are always surrounding the people on the face of the earth. Also, the dome is 120 feet up in the air, intended to create a feeling of belittlement for those who are standing below.[178] By doing so, the dome feels as though it is reaching up and touching the sky, creating a physical bridge to the stars above.[179]

[174] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[175] Johnpaul Jones. Personal Interview. 11 April 2007.
[176] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[177] Johnpaul Jones. Personal Interview. 11 April 2007.
[178] Ibid.
[179] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

The oculus at the top provides a glimpse of the night sky when looking up after sunset, further linking the person inside to the celestial activity above. Although the dome is not necessarily an obvious representation of the great celestial knowledge, it is a metaphor for this reverence to the heavens that was planned by the architect.[180]

3.4.3.3 Celestial Representation in Theater

The Main Theater demonstrates the significance of the moon to the American Indian people. Because traditional storytelling was often done at night time, the Main Theater contains several architectural references to the moon. An obvious representation of the moon is the projection of moon onto the theater curtain (*figure 23*).[181] The projection cycles and shows all eight phases of the lunar cycle. Another representation of the moon in the Main Theater is in the lighting around the outer wall of the theater. There are eight different wall sconces made of cast glass, each one of which is shaped like a different phase of the lunar cycle and specially textured and lit in a way that interprets the appearance of the moon.[182]

The theater also plots the heavens on the ceiling above. On the dark ceiling, there are hundreds of small fiber-optic lights that represent the starts on a dark night sky.[183] They are placed in a way that accurately maps the location of the stars and planets on from 21 September 2004, the day that the Museum first opened. Through

[180] Johnpaul Jones. Personal Interview. 11 April 2007.
[181] "New Hand Woven National Museum of the American Indian Theater Curtain Depicts Storyteller Raven." NMAI News. 4 April 2005. Smithsonian Institution. Office of Public Affairs. 14 September 2007. <http://newsdesk.si.edu/releases/nmai_theater_curtain.pdf>
[182] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[183] "New Hand Woven National Museum of the American Indian Theater Curtain Depicts Storyteller Raven." NMAI News. 4 April 2005. Smithsonian Institution. Office of Public Affairs. 14 September 2007. <http://newsdesk.si.edu/releases/nmai_theater_curtain.pdf>

these stars and the representations of the lunar phases, the theater attempts to recreate the physical atmosphere of the traditional story-telling setting.[184]

3.4.4 Landscapes

3.4.4.1 Physical Form

The physical form of the building is very fluid and elegantly curved and layered (*figures 24-25*). It's very massive yet delicate form is intended to be a representation of the landscape of the Southwest United States.[185] The building is clad in a Kasota limestone,[186] which is very rough in texture and similar in color to the dry desert landscape of the Southwest. This combination of form and material make the building appear as though it is a large stone mass that has been shaped and carved by the wind and water over thousands of years.[187]

This form was decided upon because it is representative of one of the most important elements of American Indian cultures.[188] This element is the land on which people live. This particular landscape is representative of the desert southwest, an area where very large numbers of American Indians lived in large cities and communities. Although it is physically a representation of this particular area, it is metaphorically representative of all the of the American Indian groups of people, as the landscape upon

[184] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[185] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[186] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>

[187] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[188] Johnpaul Jones. Personal Interview. 11 April 2007.

which they lived had an immense influence and control over how they lived their lives from day to day.[189]

3.4.4.2 Four Habitats

The building of the National Museum of the American Indian only occupies about one-fourth of the site upon which it sits.[190] The rest of the 4.25-acre site is covered by landscaping and four differently designed habitats.[191] Each habitat is representative of a different type of landscape and habitat where there were large numbers of American Indians living in times before contact with the outside world. These habitats were also chosen for their ability to thrive in the Washington, D.C. microclimate. These habitats are an upland hardwood forest, lowland freshwater wetlands (*figure 26*), meadows, and croplands.[192] Not only is having these different habitats a way of representing the different American Indian cultures, but is a way of demonstrating how crucial a role the environment and plant life played in their lives. By dedicating almost three-fourths of the property to these natural habitats, the architect was making a statement about this importance.

Each of the four zones is filled with plants that are representative of their respective their habitats. There are more than 700 trees on the site (*figure 27*), which includes Bald Cypress, Chinquapin, Common Papaw, many more species.[193] In total,

[189] Johnpaul Jones. Personal Interview. 11 April 2007.
[190] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>
[191] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>
[192] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>
[193] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007.

there are more than 33,000 individual plants on the site, each of which was selected for a particular significant to the particular habitat or a group of people (*figure 28*).[194] The plants that are grown are not only for looks and educational purposes, but they are also used for food and medicinal purposes.[195] Plants such as buttercups are marigolds are grown and used for traditional medicinal uses. Other plants such as wild rice and sunflowers are cultivated for food. Traditional agricultural methods are also used, such as the ingenious traditional method of growing beans, corn, and squash in the same place[196] as a means of sustaining the land. This is just one example of several different traditional agricultural techniques that were common American Indians that are practiced on the grounds of the museum. By designing the landscapes specifically to accommodate these different habitats and agricultural techniques, the architect was able to use the site of the museum as a tool for preserving these traditional cultural practices.

3.4.4.3 Water Features

Natural water features also played a very important role in the traditional lives of American Indians. As is obviously the case with all human beings, American Indians could not survive without a constant source of fresh water.[197] In some areas, this was not very difficult. However, in many areas where American Indians lived, water was not always abundant. In these areas, they relied upon the few available sources of fresh water that may have been available, and their lives completely depended upon its

<http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[194] Johnpaul Jones. Personal Interview. 11 April 2007.

[195] "Fast Facts: National Museum of the American Indian." National Geographic News. 21 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_indian_museum_information.html>

[196] Terhune, Lea. "National Museum of the American Indian." Publish Date Unknown. 11 September 2007. <http://usembassy.state.gov/posts/in1/wwwhspjanfeb051.html>

[197] Johnpaul Jones. Personal Interview. 11 April 2007.

continual replenishment. As a result, where they lived and how they lived often depended upon where water was available. Accordingly, the architect felt that the building could not possibly be well-representative of the American Indian cultures if there were not water on site. This is why there are numerous water features throughout the site. Many of these occur in the lowland marsh habitat that was designed. However, the other habitats also have their own source of water incorporated in one way or another.[198] There are even several small waterfalls (*figure 29*). These water features area also visible from many places within the building, most notably from the restaurant where a water feature winds right next to a large wall of windows (*figure 30*).[199] By designing this important link with the water, it is a constant reminder of the important role that it played in the lives of traditional American Indians.

3.4.5 Symbolism

3.4.5.1 Sun Doors

As mentioned previously, many aspects of the central gathering and performance area known as The Potomac are representative of the sun. This is because of the extreme importance that the sun has in the lives of most American Indian cultures and the reverence that the people held for the sun.[200] Because of this, almost all American Indian cultures, whether or not they had a written language, had some type of written or

[198] West, W. Richard. "National Museum of the American Indian: One Man's Unique Collection of Native Objects is About to Become Part of the Nation's Inheritance." Cosmos Journal. Publish Date Unknown. Cosmos Club of Washington, D.C. 11 September 2007. <http://www.cosmos-club.org/web/journals/2000/west.html>

[199] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

[200] Johnpaul Jones. Personal Interview. 11 April 2007.

carved symbol that represented the sun.[201] The architect decided to demonstrate this fact by having the different symbols for the sun engraved into the doors that lead to The Potomac (*figure 31*).[202] The doors are made of glass, and the symbols are etched in a way that is a very literal translation of traditional symbolism.[203]

3.4.5.2 Fire Stone

Another way that symbolism is used to represent the traditional culture is in the compass on the floor of The Potomac. At the center of this compass is stone inlay which as abstract interpretation of fire.[204] The fire is again representative of the sun. The sun is at the center of the compass because it is the basis and central focus of their scientific knowledge and a very large component of the belief systems of most American Indian cultures. In essence, the fire is more than just a representation of the sun; it is a symbol of one of the most important aspects of American Indian culture.

3.4.5.3 Copper Wall

Encircling The Potomac is a wall of woven copper. The wall is 100 feet long, and made from large bands of copper that have been woven together (*figure 32*).[205] In addition the large bands, there are also smaller copper elements which have a secondary weaving pattern. Combined together, they are intended to be representative

[201] Johnpaul Jones. Personal Interview. 11 April 2007.
[202] Ibid.
[203] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[204] Ibid.
[205] "New National Indian Museum is Native by Design." National Geographic News. 24 September 2004. National Geographic. 11 September 2007. <http://news.nationalgeographic.com/news/2004/09/0914_040913_american_indian_museum.html>

of traditional American Indian basket weaving patterns.[206] Basket weaving was something that was a traditional craft common amongst many different groups of people. However, the weaving techniques and materials were often very unique from one culture to the next, so the designer of the wall did not want to copy any specific pattern.[207] For this reason, a generic weaving pattern was used that was intentionally did not represent any specific culture. The result is a wall made of copper that is simply symbolic of this traditional craft of the American Indian people.

3.4.5.4 Bird Motifs

Birds are used as symbols in multiple locations within the National Museum of the American Indian. One of these places is in The Potomac.[208] The symbolism of a bird may have many different meanings in American Indian cultures, but one of the common links is that birds often represent wisdom.[209] In The Potomac, there are bird motifs on each of the elevators that lead up to different exhibit spaces (*figure 33*).[210] These elevators are also located at the Cardinal direction points. The birds were used here as a symbol of the wisdom of the traditional cultures and their understanding the sun and the naturally occurring cycles of the solar system.

[206] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[207] Johnpaul Jones. Personal Interview. 11 April 2007.
[208] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>
[209] Kiva Trading Company. "Kiva's American Indian Symbol Dictionary." KivaTrading.com. Publish Date Unknown. 14 September 2007. <http://www.kivatrading.com/symbol1.htm>
[210] "Building a Native Place." National Museum of the American Indian Online. 2007. National Museum of the American Indian. 11 September 2007. <http://www.nmai.si.edu/subpage.cfm?subpage=dc&second=building&third=architect>

Another place birds are used is on the curtain in the Main Theater.[211] Here, the symbolism of the birds has two meanings. First of all, the birds shown here are ravens, which are commonly seen by American Indians as tricksters and storytellers, which is appropriate for the curtain of a theater.[212] The second meaning of these birds is again a symbolic representation of the cardinal directions.[213] They are flying in four different directions, one each to represent north, east, south, and west. The flying pattern of the birds is symbolic of what is often seen as the fifth direction, that of verticality.

3.4.5.5 Circle Motif

The circle is a common motif amongst American Indian traditional cultures, and was commonly used as a shape for buildings, dancing, and storytelling.[214] This has been incorporated into the design of the museum in several different ways. One of these ways is in the shape of the Potomac. The Potomac is round in shape and a reflection of the importance of the circle. The Main Theater is round with open aisles around the outer walls, allowing for dancing in a circle in the traditional manner. The Lelawi Theater, another theater in the museum, is also round in shape. The compass on the floor of the Potomac and the rings marking the solstice points are also round. By incorporating these round elements, the architect was using the symbolism of the circle as a means of acknowledging the importance of this shape in the traditional cultures.

[211] "New Hand Woven National Museum of the American Indian Theater Curtain Depicts Storyteller Raven." NMAI News. 4 April 2005. Smithsonian Institution. Office of Public Affairs. 14 September 2007. <http://newsdesk.si.edu/releases/nmai_theater_curtain.pdf>

[212] "New Hand Woven National Museum of the American Indian Theater Curtain Depicts Storyteller Raven." NMAI News. 4 April 2005. Smithsonian Institution. Office of Public Affairs. 14 September 2007. <http://newsdesk.si.edu/releases/nmai_theater_curtain.pdf>

[213] Ibid.

[214] Johnpaul Jones. Personal Interview. 11 April 2007.

3.5 CASE STUDY SUMMARY

3.5.1 Summary

The National Museum of the American Indian in Washington, D.C. is a museum and cultural center dedicated to the lives and cultures of American Indian peoples of both the past and the present. Every aspect of the architectural design of the building as well as the design of the site has incorporated the traditional ideas, beliefs, and knowledge of American Indian Cultures. Although the architect had a great deal of existing knowledge about traditional American Indian cultures, he consulted with American Indian elders and other expert representatives of the culture to gain the most expert input and cultural knowledge that was possible before and during the design process. By doing so, it was ensured that the museum was to be an accurate and appropriate portrayal of American Indian cultures. The result is a museum where not only the contents held within, but the design of the facility itself, serves as a tool for the preservation and promotion of American Indian culture.

3.6 CASE STUDY CITED FIGURES

Figure 1: National Museum of the American Indian (http://www.flickr.com/photos/bootbearwdc/37802962/)

Figure 2: Johnpaul Jones, FAIA (http://www.aiaseattle.org/images/news_0604_honors06_jones_pict.jpg)

Figure 3: George Gustav Heye (http://www.voanews.com/specialenglish/Archive/images/nmai_heye_american_indian_museum_150_eng_3apr04.jpg)

Figure 4: Artifacts collected by George Gustav Heye (http://www.washburn.edu/cas/art/cyoho/archive/USTravel/WashingtonDC/71.html)

Figure 5: Signing of Agreement between Heye Foundation and Smithsonian (http://siarchives.si.edu/history/exhibits/thisday/may/nmai.jpg)

Figure 6: Sketch by Johnpaul Jones of Many Nations Longhouse (http://www.uoregon.edu/~committees/longhouse/design.htm)

Figure 7: Not Used

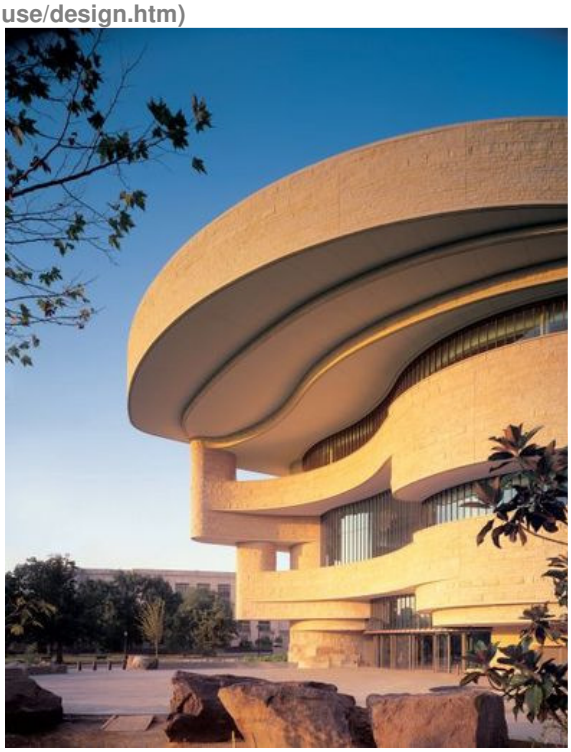

Figure 8: Grandfather Rocks in Foreground (http://z.about.com/d/dc/1/7/c/8/amind.jpg)

Figure 9: Cardinal Stones in Background (http://www.indianz.com/news/images/potomac2.jpg)

Figure 10: American Indian Artifacts (http://www.flickr.com/photo_zoom.gne?id=429910385&size=l)

Figure 11: American Indian Artifacts (http://www.flickr.com/photo_zoom.gne?id=429918091&size=l)

Figure 12: American Indian Artifacts (http://www.flickr.com/photo_zoom.gne?id=429918264&context=photostream&size=l)

Figure 13: American Indian Artifacts (http://www.flickr.com/photo_zoom.gne?id=429908913&size=l)

Figure 14: Not Used

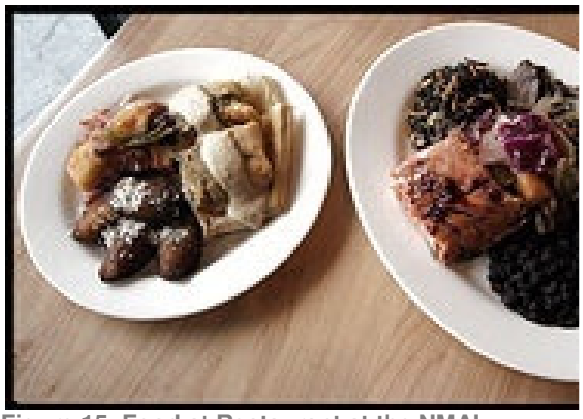

Figure 15: Food at Restaurant at the NMAI (http://www.washingtonpost.com/wp-dyn/content/article/2005/10/20/AR2005102000621.html)

Figure 16: Compass on the Floor of The Potomac (http://www.washingtonpost.com/wp-dyn/content/article/2005/10/20/AR2005102000621.html)

Figure 17: Oculus in the Dome of The Potomac (http://www.flickr.com/photo_zoom.gne?id=453843188&size=o)

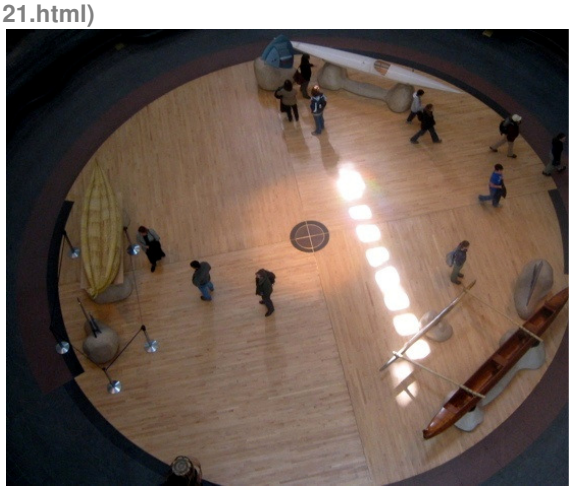

Figure 18: Beam of Light Being Cast onto Floor of The Potomac (http://www.flickr.com/photos/77945684@N00/285430221/)

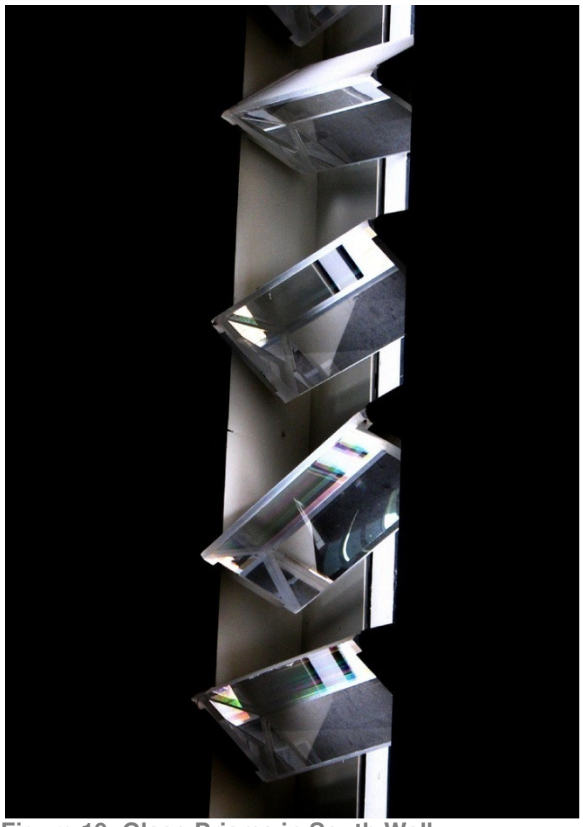

Figure 19: Glass Prisms in South Wall (http://www.flickr.com/photo_zoom.gne?id=485635532&size=l)

Figure 20: Spectrum Created by Prisms (http://www.flickr.com/photo_zoom.gne?id=1141545433&size=o)

Figure 21: Paving Which Plots the Heavens (http://www.flickr.com/photos/ki/274775947/)

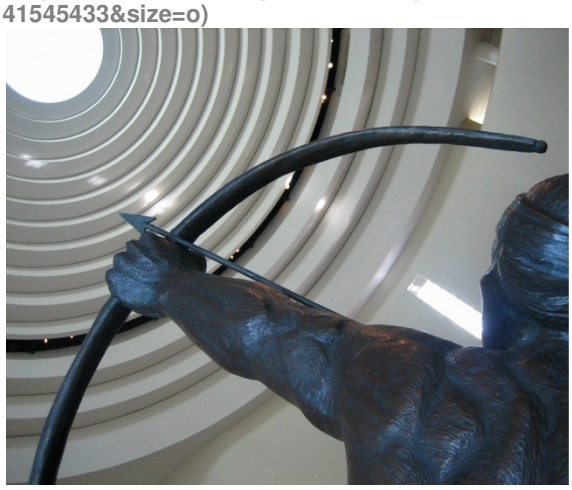

Figure 22: Dome of The Potomac (http://www.flickr.com/photo_zoom.gne?id=317471107&size=l)

Figure 23: Moon Projection on Main Theater Curtain (http://www.flickr.com/photo_zoom.gne?id=23477025&size=m)

Figure 24: Exterior Form of Building (http://www.flickr.com/photo_zoom.gne?id=249890397&size=o)

Figure 25: Exterior Form of Building (http://www.flickr.com/photo_zoom.gne?id=41003518&size=m)

Figure 26: Lowland Marsh Habitat at NMAI (http://the.honoluluadvertiser.com/dailypix/2004/Sep/26/il09a_b.jpg)

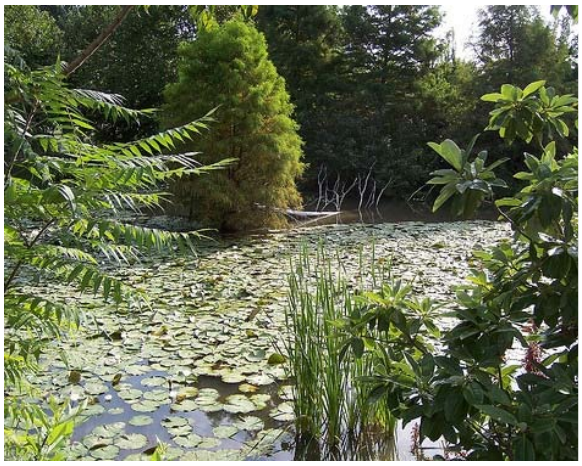

Figure 27: Trees on NAMI Site (http://www.flickr.com/photo_zoom.gne?id=1316330524&size=m)

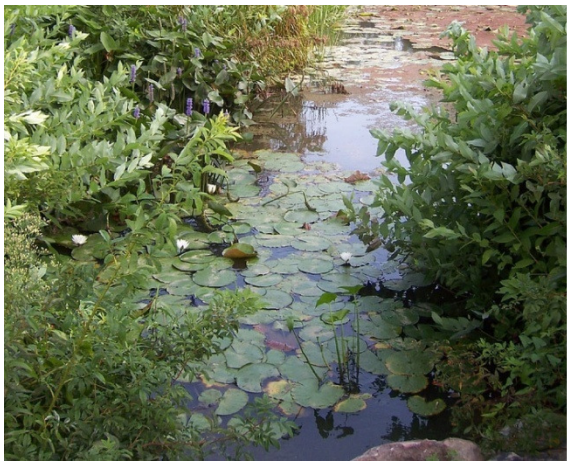

Figure 28: Other Plants on NMAI Site (http://www.flickr.com/photo_zoom.gne?id=1316330048&size=l)

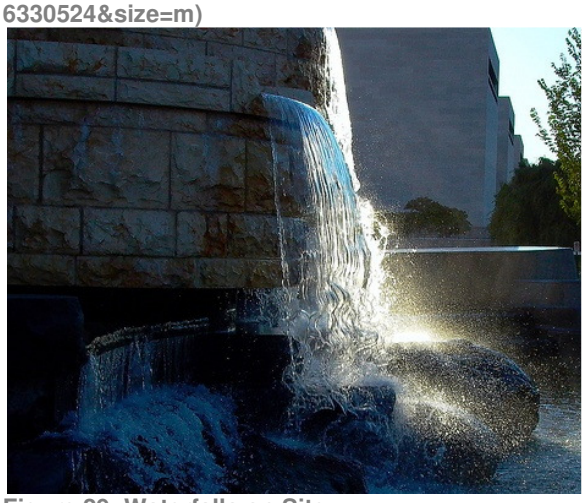

Figure 29: Waterfalls on Site (http://www.flickr.com/photo_zoom.gne?id=310041552&size=m)

Figure 30: Water Feature Outside of Restaurant (http://www.flickr.com/photos/94283635@N00/79805376/)

Figure 31: "Sun Doors" (http://www.washingtonpost.com)

Figure 32: Woven Copper Wall at The Potomac (http://www.flickr.com/photo_zoom.gne?id=121859694&size=o)

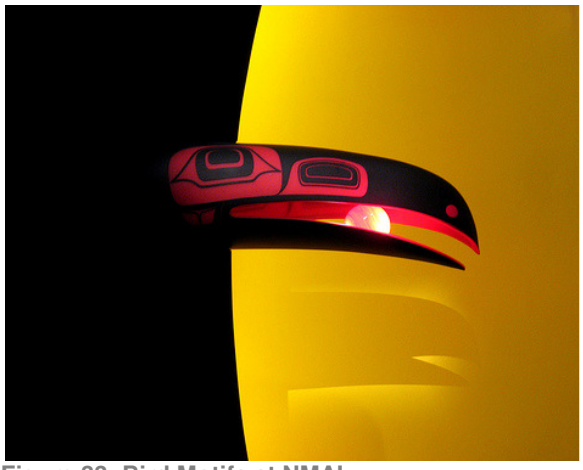

Figure 33: Bird Motifs at NMAI (http://www.flickr.com/photo_zoom.gne?id=488232217&size=m)

Chapter 4 | Project Statement
Cultural Design Methodology

4.1 INTRODUCTION TO PROJECT STATEMENT

4.1.1 Introduction

As was discovered in the two cultural architecture case studies which examined the Alaska Native Medical Center and the National Museum of the American Indian, it is important to incorporate multiple aspects of a traditional culture when using contemporary design as a tool for preserving traditional culture. Too often, it seems that the mistake is made by architects and designers of only attempting to incorporate building & construction traditions into their design, and then ignoring other significant aspects of the culture. Architecture and building traditions are only one facet of a culture. The truth is that in order for a building's design to preserve culture, it must incorporate ideas from all facets of the traditional culture. Not doing so would be irresponsible of the designer and not be truly reflective of the traditional culture. To preserve a culture is to preserve all that truly defines its existence. The simple point is this: in order for a building's design to be a tool for preserving traditional culture, it must be reflective of the culture as a whole and not just the traditional architecture.

Based upon the cultural architecture case studies, past experience, research, and personal beliefs, the following project statement will describe a methodology for using contemporary design as a tool for cultural preservation. It is the author's theory that following this methodology will result in a successful cultural design. Defined, a successful cultural design is one which preserves a traditional culture, promotes its continued existence, and is truly representative of the culture. This methodology covers what is important to learn about a culture, how to research these aspects of a culture, and how they are to be implemented into a contemporary architectural design.

4.2 CULTURAL RESEARCH

4.2.1 What to Learn

There are many different facets of a traditional culture. It can be a daunting task to try and learn about it - or even decide on what to learn. One could spend a lifetime trying to fully understand a culture and its traditions and still not know everything that there is to know. When creating contemporary cultural design, the most important thing is to try to gain an understanding of the culture as a whole, and not necessarily every detail. In order for the designer to be successful, there are several things that must be understood about the traditional culture. These items are described below.

4.2.2 Belief Systems

The designer must have an understanding of the belief systems of a culture. Quite often, the belief system revolves around a particular religion or indigenous religious beliefs. Although this methodology is intended to be used for vernacular architecture and not necessarily the sacred, the belief system is still extremely important. This is not so much because of what it may tell the designer about how to design the building, but more so things to avoid. Belief systems and religions are very particular. Even within a culture, there may be several different translations, sects, or differences in beliefs. Attempting to incorporate these ideas into a secular design will undoubtedly result in disaster. It will be impossible to please everyone, and more than likely, the design will please very few people and offend a majority. For this reason, religious

beliefs and issues should be avoided when designing vernacular structures. However, if they are not understood, there will be no way to avoid misinterpreting the beliefs.

Understanding the belief system of a traditional culture is important for another reason. By understanding a belief system, the designer will have a better understanding of what drives the people of that particular culture in their everyday lives. What is important to them? What are their views on life and death? The answers to these questions will most likely not have a direct impact on the design itself, but will help the designer put him or herself in their shoes, and have a better understanding of how members of the culture are going to view the design decisions that are made.

4.2.3 Cultural Themes

What aspects of the traditional culture are most indicative of who the people are? How did these aspects affect the lives of ordinary people? These are some very important questions that need to be answered. They are not necessarily the most "important" aspects of the culture, as this could be very subjective depending upon the individual. However, the aspects of the culture which best describe it should be discovered. These aspects will be the overriding themes that appear and reappear throughout the different facets of culture. For example, with many indigenous cultures, these themes may be a strong relationship with the land, celestial understanding, or social hierarchies. These major themes of a culture, of which there will undoubtedly be several, will have a large impact on the outcome of the eventual architectural design.

4.2.4 Most Unique Aspects of a Culture

It is also important to learn what the most unique aspects of a culture are. These may be the aspects that make the culture stand out on a global scale, and they may also be the things that differentiate the culture from its neighbors. The Hawaiian culture, for which the design portion of this project will focus, is a good example to look at. At a global scale, what makes traditional Hawaiian culture stand out from other cultures around the world? What makes the culture different from other cultures of the Pacific? What differentiates the Hawaiian culture from other Polynesian cultures? It is usually these unique features that people are very proud of, set it apart from others, and ultimately keep the culture alive and vibrant. Accordingly, these aspects will provide opportunities for architectural design, but more importantly, are essential to preserving the culture.

4.2.5 Land and the Environment

As defined at the beginning of this project, a traditional culture is a culture which existed before being critically changed or impacted by outside societies. The only technologies used by a traditional culture were those developed from within. This typically results in traditional cultures which have a very strong connection with the land and natural environment. This is almost inevitable as the environment controls a vast majority of the make-up of a culture, from the type of food that was eaten, the buildings that were lived in, the clothing that was wore, and quite often the religious beliefs that were followed. Every traditional culture is largely influenced by the land and natural environment in which it exists. The difference lies in how the land was viewed by the

people, how it was used, and what accommodations were made to live within it. Learning about these issues is critical to the success of the cultural architectural design.

4.2.6 Traditional Crafts & Arts

Traditional crafts and arts play a large role in defining a culture. Crafts and arts were rarely created for purely decorative purposes and usually had a functional reason or spiritual belief backing their creation. Therefore, understanding the reason for their creation and ideas that went into the particular details of their creation will be very telling of the culture. Examples of traditional craft and arts as discovered in the cultural architecture case studies include architecture, building techniques, weaving, basket-making, and sewing. In these cases, the architects understood why these particular items were created and specific details used. By doing so, they were able to incorporate these ideas into many different parts of a design.

4.2.7 Commonalities between Similar Cultures

Understanding commonalities between similar cultures is critical when designing a building for multiple cultures, such as was the case with both the Alaska Native Medical Center and the National Museum of the American Indian. In Alaska, there are over a dozen major groups of people with literally hundreds of subdivisions. The American Indian culture is even broader, as Alaska Natives are considered one part of that culture. In both of these cases, the architect understood the common links between these cultures so there wouldn't be specific parts of the design that only applied to a particular subset of the larger culture or group of people. If the design is for a "broad-stroke" culture such as is with the two case studies, knowing these common links makes

it possible down the road in the design phase to create a building which applies to all subsets of the larger culture.

4.3 CULTURAL RESEARCH METHODOLOGIES

4.3.1 Reason for Cultural Research

In creating cultural architecture design, the research process is very important. It would be easy to pass over this step very quickly in order to move forward with design, but this must not be done. Performing in-depth cultural research is the only way for one who is not a member of that culture to understand it at a level which is required for using contemporary design as a tool for preserving the culture. This will ensure that the designer interprets the culture in a manner that is true, accurate, and does not self-impose his or her own opinions or pre-conceived notions about the culture onto the people for whom the design is to represent.

4.3.2 Interviews and Committees

Speaking with members of the culture is the best way to begin the research process. In the case that the culture is no longer practiced in its traditional form, experts or scholars of the culture would be the next best option. These are the people who will be able to describe the culture in a way that can be understood by an outsider. If asked to describe the culture, they will more than likely give the major themes and most unique elements that were mentioned above. Also, the cultural member or expert will know where to find more information about specific aspects of the culture that the architect may be most interested in for their particular design problem or situation.

This type of source is also the most reliable because it is coming from someone with first-hand knowledge and understanding of the traditional culture. Getting information from these sources may come in the form of personal interviews, small committees, or large question and answer forums. The most important part is finding the right people to ask the questions. Who are the recognized experts of the traditional culture? Who is currently practicing the traditional culture? Who has authored books about the culture? Who are the current scholars of the traditional culture? These are the important questions to ask when finding the appropriate people to interview.

4.3.3 Existing Published Materials

Today, most traditional cultures have been researched and explored by scholars and anthropologists, so there will likely be existing published materials about the culture. In some cases, there may be little information available. In others, there may be so much that it is difficult to decipher and decide where to start. If this is the case, it is important to look back to Part 2, which describes the aspects of culture that are most important to focus on.

Searching published materials can be done using typical research methods. The internet is usually a great place to start, but is not typically reliable as a sole source due to the fact that the origin of information cannot always be accurately identified. Existing books and magazine or journal articles are also great and typically more reliable than the internet. Other helpful published sources may be video tapes, recorded interviews, or even educational television programs or televised interviews.

4.3.4 First-Hand Experience

Interviews and published materials are the most reliable sources for accurate information about traditional culture, but actually experiencing a culture first-hand is something that cannot be replaced. As was seen in the Alaska Native Medical Center case study, the architect spent many weeks living in remote villages of Alaska where many facets of the traditional cultures remained widely in use. For the National Museum of the American Indian, the project architect was a member of the culture being designed for and had a great understanding of traditional cultural practices. For this reason, he did not need to perform this step. However, assuming that the designer does not have this type of personal knowledge of a culture, first-hand experience cannot be replaced.

The purpose is to get personally involved with the culture to try and understand it, or at least some portion of it, to a level where the designer feels personally attached and sees the necessity of preserving it. This personal attachment is what will drive the designer to make sure that every design decision which is made takes into full consideration the traditional culture at hand. Experiencing the culture first-hand may come in several different forms. Spending time living amongst people who practice the traditional culture is probably the best way of doing this, but may not be possible due to the fact that not all traditional cultures remain widely practiced. In this case, participating in a traditional ceremony or some other cultural event would be the next best option.

4.4 IMPLEMENTATION STRATEGIES

4.4.1 Incorporating All Aspects of Culture

As was previously mentioned, the architectural design should reflect the culture as a whole and not only the traditional architecture, construction, and building techniques. Contemporary design cannot serve as a tool for cultural preservation if it only reflects this one facet of the culture. The most important thing is that all aspects of a culture are represented, and that the representation is proportional to the significance of the aspect within the culture.

4.4.2 Planning & Use of the Site

4.4.2.1 Traditional Site Use

When planning and deciding upon the use of a site, the most important rule is to follow the guidance of the traditional culture. Because traditional cultures did not have mechanically controlled environments or the ability to "overpower" nature, their use of a site, which includes the placement of buildings, was usually done in a manner that allowed them to live in harmony with nature. This is something that cannot be ignored when using design as a tool for cultural preservation.

Following the guidance of the traditional culture, however, is not to say that the site must be designed exactly as it would be done within the culture. For example, if within the traditional culture buildings are always placed next to a body of water, it does not mean that the contemporary building has to be placed right next to the water. The appropriate process is to understand why the building is sited in that manner. Is it because it offers the most convenient access to drinking water? Is it because water is a

convenient transportation method and easy access is preferred? Is it because the prevailing breeze usually comes from the water? Is it a religious belief that living next to the water will ensure good fortune? Or, maybe the reason for siting buildings next to the water is something completely different. Whatever the reason, it must be determined. The reason which is discovered will determine where the buildings should be placed. If the answer was convenience for drinking water, maybe the building on the new site should be placed closest to the site's drinking water access (whether or not this comes from a natural body of water). If the building placement is a result of transportation, maybe the new building should be placed nearest the major mode of transportation, which could be a highway, a rail or bus station, or maybe even a harbor. This is just one example, but it could be applied to every aspect of the design of the site. Essentially, the site design and land use should be reflective of the same ideas that are used within the traditional culture, and not necessarily an exact replication of traditional site design.

4.4.2.2 Major Cultural Themes

The site design should also reflect the major cultural themes that were discovered during the research phase. For example, if it was discovered that a major theme of the culture was celestial knowledge and understanding, this idea should be carried into the overall planning and programming of the site. This could be done through mapping the stars, tracing solar cycles, or some other creative method of portraying this theme in the design. Because the design of the site and overall planning is crucial to any architecture project, the major cultural themes should be apparent in this portion of the design.

4.4.2.3 Traditional Function

The site should incorporate traditional functional spaces. It is possible that the building type being designed didn't exist within the traditional culture. For example many traditional buildings didn't have a specific building type that was used as a hospital. However, they may have had specific places for practicing indigenous medicine or healing, so these types of spaces should be reflected in the design of a contemporary hospital. In the case that the contemporary design has no correlation whatsoever to a traditional function, such as possibly a science laboratory, the planning of the laboratory spaces on the site may not relate to traditional function. In this case, however, spaces should be provided to accommodate other traditional functions, such as ceremonies or events which may be related.

4.4.2.4 Site Feature Interpretations

In many traditional cultures, the people had built forms which either affected or changed the appearance of the landscape. These forms could be caves, rock sculptures, dirt mounds, gardens, terraces, or any number of other things that most likely had a functional reason behind their creation. The reason for their creation may no longer be relevant in a contemporary society, but their physical form is something that may reflect upon traditional ideals. Incorporating these features into the design of a contemporary building site is a way of preserving some of these ideals. This should be done in a way that is not a replication, but rather an interpretation of the traditional site feature that makes functional sense in a contemporary society.

4.4.3 Building Planning

4.4.3.1 Function is Top Priority

When planning a building (or buildings) on a site, function should always be the top priority. Although the goal of this project is to create architecture which serves as a tool for cultural preservation, it is important that the contemporary function never be far from mind. A contemporary building can only preserve culture if it is a usable structure. This would seem to be an obvious statement, but it is an important reminder that critical space adjacencies and basic architectural design principles should never be ignored, regardless of the cultural design statement being made. Doing so would be an irresponsible action on the part of the designer and not result in a successful design.

4.4.3.2 Major Cultural Themes

After function, reflecting upon the major cultural themes is the next most important part of the building planning process. These major cultural themes are essentially serving as the central design concepts, and thus reflected in every part of the design. If one of the major themes is celestial knowledge as discussed in the site design section, this idea should also be carried into the planning of the building. If another theme is a connection to past ancestors, the building should reflect this as well. Essentially, the major cultural theme should provide the basis for the overall organization of spaces and building planning.

4.4.3.3 Crafts and Arts

Traditional crafts and arts are typically very identifiable aspects of a traditional culture. Incorporating them into the design is a way visually showcasing this aspect of the culture. This can be done in a couple of few different ways. First, the organization of

spaces or circulation can be representative of a traditional craft, either in form or in function. Also, the building form itself could be representative of the traditional craft. As always, being too literal with the form or appearance of the craft could result in a misuse of its true meaning, so the craft should always be interpreted generically rather than replicated exactly.

4.4.3.4 Land & the Environment

The traditional views on land and the environment should also be incorporated into the building. Before the invention of contemporary technologies, people living in most traditional cultures were directly influenced by the land and environment in which they lived. For this reason, nature was respected and cared for, so it should be treated the same way with the contemporary building design through sustainable design strategies. In other cases, the culture may have had different views, seeing the environment as a resource which was there for them to take advantage of. If this is the case, the building should take full advantage of the natural resources of the site reflecting upon this traditional belief. Regardless of the specific ideas of a culture toward the land and environment, the views should be incorporated into the design of the building.

4.4.3.5 Traditional Forms, Spaces, & Volumes

Over time, traditional cultures often develop a particular building form or style which is unique to their own culture. This may occur for several different reasons. For example, buildings may take on a specific shape due to religious beliefs, climatic conditions, or structural capabilities of the available materials. Regardless of the reason, the unique form could be represented in the contemporary building. This could be accomplished in several ways. One way is to generically interpret the physical form so

that the building's exterior physically resembles the traditional form. It may also be accomplished by representing the unique interior volume or space which has resulted from building form. And en even more subtle way of incorporating the form would be to discover the reason for the traditional form (climatic conditions, for example) and let that be the driving force for the contemporary form.

4.4.3.6 Position in the Landscape

Another way of incorporating the traditional culture into the planning of the building is by reflecting how the traditional buildings fit within the landscape. If the traditional buildings were dominating elements over the landscape, then the contemporary structure should have the same feel. If the buildings were nestled into the natural features of the land and blending with the environment, the contemporary building should reflect this attitude. It is also possible that the traditional buildings were in caves or underground. If this is the case, then the contemporary design should also be built into the ground. Basically, the contemporary building should demonstrate the same traditional value of how a building should fit in with its surroundings.

4.4.4 Architectural Features

An architectural feature is a specific building element or detail which is not necessarily directly related to the site or building planning, but portrays a specific area of the traditional culture. There are many different types of architectural features, including traditional patterns, traditional textures, material interpretations, craft interpretations, event features, and traditional detail interpretations.

The first type of feature is a traditional pattern. In most traditional cultures, there are different types of patterns and symbols that appear in different crafts and arts.

Including interpretations of these patterns is one way of expressing an element of the culture at a detail level. The pattern can be represented in any number of ways, but it is important that pattern is a generic interpretation and not an exact replication as this will ensure that it is not used inappropriately. An example of this type of feature comes from the Alaska Native Medical Center (ANMC) case study, where a brick pattern is used on the exterior of the building which is representative of traditional patterns found in Alaska Native crafts.

Another type of architectural feature is a traditional texture. Incorporating textures into architecture is a way of enhancing the experiential nature of design. Within a culture, there are undoubtedly many different types of textures that are easily recognizable. The texture may come from an art or craft, or it could also come from a natural feature of the landscape or environment. Recreating this texture on or in a portion of the building will feature this part of the culture and bring it to the attention of the building users. The exterior surface of the National Museum of the American Indian (NMAI) provides an example of this. The building's rough sandstone texture is representative a texture found in the landscape of specific group of American Indian people.

Material interpretations are another type of architectural feature. A material interpretation is a contemporary material which is in some way representative of a traditional material. The traditional material may have been used for its color, its texture, its transparency or translucency, or possibly even its scent. Using a contemporary material that has this same quality as the original material is a way of representing traditional buildings by taking advantage of contemporary technology and construction materials. An example of this type of feature is found at the ANMC in the oculus of the central gathering area. Here, the translucent quality of the material chosen is representative of the material often used in roofs of traditional buildings.

A traditional craft may also be represented as an architectural feature. Crafts are usually more visually recognizable than ideas or beliefs, so representing a traditional craft or art in either form or appearance is typically an easier method of preserving these aspects of a culture, while at the same time making it obvious to the user of the building. As always, the interpretations should not be too literal.

Another type of architectural feature is an event feature. This is an element or detail of the design which brings a specific event to the attention of the user. An example of this is found in "The Potomac" at the NMAI. In this space, there are holes in the ceiling which project a beam of light from the sun onto the floor, and during the equinoxes and summer solstice, the beam lines up with specific elements on the museum floor. This type of feature is used to highlight events that are extremely significant to the traditional culture.

The next type of architectural feature is a construction detail interpretation. Because traditional buildings around the world have distinct and varied appearances, they also have unique construction details. Quite often, the construction details are no longer used because more contemporary materials and construction techniques have made them obsolete. However, these traditional details can be interpreted using the more contemporary materials in a way that is visually similar or connected in a similar manner.

Several types of architectural features have been described above, but this is not to say there aren't others. Basically, an architectural feature is detail or element that highlights a specific aspect of the traditional culture. It probably does not have an effect on the overall planning or organization of the building or site, but brings the cultural aspect of the design to a more human scale. Using architectural features is a way of making ensuring that the traditional culture is the basis for every design decision which is made.

4.5 METHODOLOGY SUMMARY

4.5.1 Summary

This methodology was created as a means of creating contemporary architectural design which serves as a successful tool for cultural preservation, with success being defined as a design which preserves the traditional culture, promotes its continued existence, and is a true and accurate representation of the culture. These procedures outlined above, being comprehensive cultural research, appropriate research methodologies, and implementation strategies, form a process which will lead to a successful cultural architectural design.

Chapter 5 | Hawaiian Cultural Research

5.1 INTRODUCTION TO CULTURAL RESEARCH

5.1.1 Cultural Research Introduction

As explained in the Cultural Design Methodology, performing cultural research is critical to the success of any project which wishes to preserve traditional culture. Therefore, a great deal of information must be learned about the Hawaiian culture, as that is the focus of this design project. The aspects of the culture which will be discussed are religion and beliefs, major cultural themes, the most unique aspects of Hawaiian culture, traditional views on land use, crafts and arts, and the traditional educational system. It is important to note that the author does not claim to be an expert on Hawaiian culture, but is basing his analysis of the culture on research conducted which applies the research process explained in the Cultural Design Methodology. Attempts have been made to consult experts and use reliable sources to ensure that the information about the culture contained below is as accurate as possible from one who is not a member of the traditional Hawaiian culture.

5.2 RELIGION AND BELIEF SYSTEMS

5.2.1 Religion

Much information about traditional Hawaiian religious beliefs has been lost over time, in part because of the political situation in Hawaii when Western settlers arrived and the ensuing Christian missionaries imposed their beliefs on the local population.[215]

[215] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 265.

Much information has been retained, though, and when compared with other similar Polynesian civilizations, a general picture can be drawn.[216] Also, because there was a *kapu* under penalty of death that much of the religious beliefs be kept secret by *kahunas.*[217] There is also a chant which has been passed on, known as the *Kumulipo*, which is essentially a creation chant that tells of the history of Hawaiian peoples, the land, and their religious beliefs.[218] This chant is over 2000 lines long, and could be compared to the Christian Bible in its thoroughness of depicting the Hawaiian belief system.

The religious system is based around the belief in four major gods.[219] They are regarded as invisible spirits, but symbolized by material objects.[220] One of these gods is *Kane,* who is representative of the Supreme Being.[221] *Kane* is considered the father of all living things, and identified with sunlight and freshwater, the sources of all life.[222] He is also associated with the direction east.[223] *Lono* is another one of the gods, and is associated with rain, agriculture, peace, cloud forms, black pigs, and the south direction.[224] *Ku* is the god of the chiefs and of war.[225] *Ku* is also the god associated with upright forms.[226] *Kanaloa* is the god of the ocean, and often associated with death and darkness.[227] There are also many lesser gods and demi-gods, but these are the four

[216] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 465.
[217] E.S. Craighill Handy. "Religion and Education." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 43-45
[218] Kenneth Emmory. "Religion in Ancient Hawaii." Aspects of Hawaiian Life and Environment. (Honolulu: The Kamehameha Schools Press, 1965), 85
[219] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 465.
[220] Ibid.
[221] E.S. Craighill Handy. "Religion and Education." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 45
[222] Ibid., 46
[223] Davianna McGregor. Comments during interim project review. 07 December 2007.
[224] Ibid.
[225] Davianna McGregor. Personal Interview. 24 September 2007.
[226] Davianna McGregor. Comments during interim project review. 07 December 2007.
[227] Native Hawaii. Publish date unknown. NativeHawaii.com. 12 October 2007. <http://www.nativehawaii.com/hawaiianlegends.html>

which are seen as the most significant.[228] There are also family and ancestral gods, known as *'Aumakua*.[229] Most families have their own *'aumakua*, which represents their ancestral tie to the land and the animal kingdom.[230] Often, these *'aumakua* are in the form of animals, and it is considered kapu to eat or harm them in any way.[231]

These gods were often represented and honored by material objects (*figure 1*).[232] Images of the gods were created through the use of many different materials, including wood, stone, shells, and feathers.[233] Some of the most expressive and detailed images were carved in wood, and may include shell inlays and the use of human hair (*figure 2*).[234] These carvings are similar to those found in other Polynesian societies, but have specific characteristics which make them unique.[235] To honor the gods, various forms of structures and altars were built, all of which had a specific meaning and intention.[236]

5.2.2 Makahiki

One of the most important celebrations of the year was that of the *Makahiki.* The *Makahiki* is a celebration of *Lono,* who is the rainmaker and the god of agriculture.[237] Essentially, the *Makahiki* is an annual harvest festival, which is commonly found in traditional cultures around the world. It is a holiday which covers approximately four

[228] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 465.
[229] Kenneth Emmory. "Religion in Ancient Hawaii." Aspects of Hawaiian Life and Environment. (Honolulu: The Kamehameha Schools Press, 1965), 85
[230] Kenneth Emmory. "Religion in Ancient Hawaii." Aspects of Hawaiian Life and Environment. (Honolulu: The Kamehameha Schools Press, 1965), 85
[231] Ibid.
[232] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 465.
[233] Ibid., 465-500
[234] Ibid.
[235] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 467
[236] Kenneth Emmory. "Religion in Ancient Hawaii." Aspects of Hawaiian Life and Environment. (Honolulu: The Kamehameha Schools Press, 1965), 85
[237] E.S. Craighill Handy, and Elizabeth Green Handy, and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 335

consecutive months[238] and marks the beginning of the rainy season.[239] It began in late October or early November and corresponded directly to the first rising of Pleiades above the night-time horizon.[240] The *Makahiki* was a time of peace where war was *kapu*.[241] It was a time of feasting, games, and general festivity.[242] During this time, many different shrines were built or re-built to promote abundant crops and a good harvest.[243]

The *Makahiki* was time of many different religious and political ceremonies.[244] One of the most important was the initial ceremony that kicked off the celebration, where the god *Lono* would come to each district.[245] This was basically a political ceremony, which was the way in which taxes were collected. The taxes were collected as offerings to *Lono,* which were placed on an altar in each individual district.[246] Priests would come to each district, carrying a pole with a small head or carved wood atop with *kapa* hung below (representing *Lono)*,[247] and accept the gifts which were offered (*figure 3*).[248] Upon

[238] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 60
[239] E.S. Craighill Handy, and Elizabeth Green Handy, and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 329
[240] E.S. Craighill Handy, and Elizabeth Green Handy, and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 329-330
[241] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 61
[242] E.S. Craighill Handy, and Elizabeth Green Handy, and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 385
[243] Ibid.
[244] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 60
[245] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 159.
[246] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 61
[247] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 159.
[248] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 61

acceptance of the offerings, which were then brought back to the king, the time of celebration, hula dancing, sports, games, and feasting would begin.[249]

Another important ceremony associated with the *Makahiki* ceremony was the one which it ended with. Here, the King would represent *Lono* and paddle off shore in a canoe.[250] When coming back into shore, he would be surrounded by a group of men with spears, as he was no longer considered worth of representing *Lono.*[251] The men would hurl their spears at the king, and he would have to fend them off. By doing so, he proved himself capable of being a king.[252] After he had proven himself, one of the men would touch the king with his spear, which would symbolically put an end to the *Makahiki* festival.[253]

5.2.3 Death and Burial

Specific procedures and ceremonies were followed after someone had died. Upon death, a *kapu* was imposed until the person was buried.[254] This could be only one or two days for a commoner, or up to ten days for an *ali'i.*[255] The *kapu* applied to all of the relatives and family members who were living in the same *kauhale* as the person who had passed, as well as anyone else who came in contact with the relatives.[256] Family and close friends would gather to mourn, and demonstrate their grief through various forms of self-mutilation, such as the cutting of their hair or even knocking out

[249] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 61
[250] E.S. Craighill Handy. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 62
[251] Ibid.
[252] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 384
[253] Ibid.
[254] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 565
[255] Ibid.
[256] Ibid.

their own teeth.[257] After death, high-ranking *ali'i* were often deified and took on a somewhat godly form. In almost all cases, those who had passed were honored and worshipped by their ancestors for generations to come.[258]

After death, the bodies of the passed were buried, which could take place in the sand, earth, stone cists, platform tombs, caves, or even royal mausoleums.[259] *Ali'i* would be buried during the night so that the location of their remains would be concealed.[260] Bodies were typically wrapped in *kapa* cloth, and sometimes also with a pandanus mat, and tied with a cord.[261] Sometimes, only certain bones would be buried in the *kapa* bundle, and other times the entire body was buried.[262] As is the case with almost all cultures, burials were seen as a permanent place of rest, and the remains were not to ever be disturbed.[263]

5.2.4 Mana

Mana is a very important part of the Hawaiian belief system. *Mana* is a power possessed by man, but originating in the super-natural, and thus always imbued with a spiritual power.[264] *Mana* is the existence of and very aura of power.[265] It is a concept that is very difficult for people with a Western upbringing to understand, as it gives a certain force to all objects on the earth. Everything has *mana*.[266] Basically, everything, including people, the trees, animals, the earth, all contain *mana*.

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[257] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 565
[258] Davianna McGregor. Personal Interview. 24 September 2007
[259] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 570-573
[260] Ibid., 569.
[261] Ibid., 566.
[262] Ibid.
[263] Davianna McGregor. Personal Interview. 24 September 2007.
[264] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 149.
[265] Ibid., 150.
[266] Maile Andrade. Personal Interview. 09 October 2007.

This was demonstrated to the author during a visit to the island of Kaho'olawe, where a traditional *hale* was being built (*figure 4*). It was explained that everything one does while building the hale has *mana*.[267] Our *mana*, which is our personal power, will be transferred into the hale while it is being built. Attitude, actions, and intentions all affect our *mana*, which is then transferred into the *hale* itself, where it will remain forever. Therefore, the attitudes and *mana* of the individuals building the *hale* were important to the long-term life of the structure.[268] This concept, although foreign to many Westerners, is one that exists throughout Polynesia, and has a very profound effect on the everyday lives of the Hawaiian people.[269]

5.3 MAJOR CULTURAL THEMES

5.3.1 Relationship with the Land

One of the themes of the traditional Hawaiian culture is a strong relationship with the land and natural environment. According to Hawaiian beliefs, land is not a commodity, such as is typically the case in today's world.[270] Land is something that people deeply care for and feel a responsibility to keep it vibrant and well.[271] E.S.C. Handy described this relationship very well when he stated that "first one must understand the difficulty of life in this rugged environment and the hard work involved in one's sustenance, which results in an awareness of the preciousness of life against these odds, rendering precious these very features of nature which threaten their

[267] Craig Neff. Personal Interview. 21 August 2007.
[268] Craig Neff. Personal Interview. 21 August 2007.
[269] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 150.
[270] Davianna McGregor. Personal Interview. 24 September 2007.
[271] Ibid.

lives."[272] Basically, Hawaiian people realized the power of nature, and thus felt the need and responsibility to take care of it.

The land is also very important because everything that Hawaiians use in their lives comes from the land.[273] Their food, medicine, houses, clothing, leis, soaps and dyes, and even lights were obtained from plants.[274] Hawaiians were traditionally very good at understanding the land, and had discovered the value of every useful root, bark, fruit, wood, and leaf.[275] They had a varied diet, somewhat unusual for Polynesian cultures, which consisted in part of taro, sweet potatoes, and bananas which they had learned to cultivate.[276] They also had learned to prepare and use about 300 different plants and herbs for different medicinal purposes (*figure 5*).[277] This great dependence on the plant life shows how extremely important the relationship with the land was to traditional Hawaiian culture.

This relationship with nature is also prevalent in the personal and ancestral ties to the land. According to Pukui, Hawaiian legend tells that the first human was a child of a god and a taro plant,[278] thus people are actually direct offspring of the land. People also have ancestral ties to the land through their *'aumakua*, which as discussed previously, is their personal or family ancestral god, usually in the form of an animal.[279] Families also had responsibilities to certain areas of the land which their ancestors had

[272] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 43
[273] Davianna McGregor. Personal Interview. 24 September 2007.
[274] Judd, Albert F. "Trees and Plants." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 273
[275] Ibid.
[276] Ibid.
[277] Wise, John H., and Nils P. Larsen. "Medicine." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 253
[278] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972)
[279] Emmory, Kenneth. "Religion in Ancient Hawaii." Aspects of Hawaiian Life and Environment. (Honolulu: The Kamehameha Schools Press, 1965.), 86.

cared for and cultivated for generations.[280] All of these are examples of how people are personally tied to and have a relationship with the land.

5.3.2 Relationship with the Ocean

In Hawaiian culture, the people also have a deep relationship with ocean.[281] One of the ways in which this relationship is apparent is in the food that comes from the ocean. Hawaiians had perfected the use of fish ponds for cultivating and growing fish for food (*figure 6*).[282] Hawaiians also caught a lot of their fish using many different methods, such as inshore fishing, offshore fishing, late night fishing, and deep sea fishing.[283] Fishermen were considered to be some of the most skilled people on the islands and were much respected for their skill and abilities to provide food for their *'ohana*.[284] Hawaiians also developed a way of taking salt from the sea through sophisticated evaporation methods, which was then used as a seasoning and preservative for food.[285]

The strong relationship with the ocean is also apparent in the medicines that were used. Although most medicines were made from plants, many also used elements from the sea.[286] Using their evaporation techniques, they used salt for medicines as well as seasonings. Salt was often taken internally, usually as part of a mixture or solution, to help heal severe injuries.[287] It was also used externally to help heal open wounds and

[280] Davianna McGregor. Personal Interview. 24 September 2007.
[281] Ibid.
[282] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 256.
[283] Maunupau, Thomas. "Aku and Ahi Fishing." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 101
[284] Ibid.
[285] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 96.
[286] Wise, John H. "Food and Its Preparation." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 254.
[287] Ibid.

cuts.[288] In addition to salt, Hawaiians also used seaweed and some animal products for medicines.[289]

The relationship with the sea was also important for sailing (*figure 7*).[290] Hawaiians had a very deep understanding of the ocean which they used for sailing. In addition to their navigation techniques relating to the stars (discussed later), they also had to have a very keen sense when it came to currents, tides, and other ocean phenomena in order to be successful in their ocean-going journeys.[291] Obviously, Hawaiians have learned to do this well, as they made regular journeys around and between the islands, as well as long voyages across the Pacific.[292]

5.3.3 Astronomy

Another theme that is prevalent within traditional Hawaiian culture is that of astronomy, as there are multiple ways that knowledge of astronomy has an effect on the day-to-day lives of Hawaiian people (*figure 8*).[293] One of these ways is through the calendar that was developed as a result of this knowledge.[294] Hawaiians were able to track the movements of the sun, the moon, the stars, and the planets across the sky to develop a very accurate calendar.[295] A *mahina*, or month, was calculated using a complete lunar cycle.[296] A year was calculated by tracking a complete cycle of the sun,

[288] Wise, John H. "Food and Its Preparation." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 254.
[289] Ibid., 255.
[290] Davianna McGregor. Personal Interview. 24 September 2007.
[291] Davianna McGregor. Personal Interview. 24 September 2007.
[292] Ibid.
[293] Ibid.
[294] Ibid.
[295] Bryan Jr., E.H. "Astronomy and the Calendar." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 247.
[296] Ibid., 249.

as well as the appearance of certain stars in the night sky.[297] They also had very accurate knowledge of solstices and equinoxes.[298] Most importantly, however, was how this knowledge was used as a guide for when to plant and harvest crops and when ceremonies should take place.[299] It was so exact, that exact dates associated with exact phases of a moon in a specific month would determine when crops should be planted.[300]

The importance of astronomical knowledge is also visible in many old Hawaiian buildings which are currently being studied my archaeologists.[301] It has been discovered that many traditional buildings have alignments with specific starts and solar events, such as the *hoku pa'a* (The North Star) or equinoxes.[302] It is believed that this was done for two different reasons, which were to pay homage to the importance to the heavens and the stars, and also to serve as tracking devices and calendars.[303] Regardless of the reason, the fact that buildings are aligned with these celestial bodies demonstrates their importance to the Hawaiian culture.

Astronomy was absolutely critical to traditional navigation techniques.[304] Not many people in the world had a better understanding of the stars than did Hawaiian navigators.[305] Because of this extremely sophisticated knowledge of the stars, they were track rising and falling of stars to steer their canoes in whichever direction they desired, always knowing where they were going.[306] Although the navigators understood the

[297] Bryan Jr., E.H. "Astronomy and the Calendar." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 247.
[298] Davianna McGregor. Personal Interview. 24 September 2007.
[299] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 10.
[300] Ibid., 30-36
[301] Davianna McGregor. Personal Interview. 24 September 2007.
[302] Ibid.
[303] Ibid.
[304] Bryan Jr., E.H. "Astronomy and the Calendar." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 247.
[305] Ibid.
[306] Kenneth Emmory. "Navigation." Ancient Hawaiian Civilization. (Honolulu, The Kamehameha Schools Press, 1933.), 243.

entire night sky and could read it like a map, there are several star groups which are said to be most important, which are *Huihui* (Twins, Castor and Pollux), *Makali'i* (Pleides), *Makali'i* (Twins, Castor and Pollux), *Na Kao* (Orion's belt and sword), *Na Hiku* (The Big Dipper), *Hoku Pa'a* (The North Star, Polaris), and *Newe* (The Southern Cross).[307] Although a specialized field, navigation was obviously an extremely important part of the culture as it allowed Hawaiians to travel to Hawaii and between the islands, and it wouldn't have been possible without this extensive astronomical knowledge.

5.3.4 Family & Ancestral Ties

The tie that Hawaiian people have with their family history and ancestors is also a major theme within the culture.[308] This is demonstrated by the importance that is placed on ancestry. These ties are first explained in the *Kumulipo*, which is the creation chant, which gives a very long lineage and ancestry of Hawaiian peoples.[309] This chant is extremely important for many reasons in Hawaiian culture, and this honoring of the ancestors is one of them.

This importance of ancestry is very apparent in the hierarchical class system of the people, which is mostly determined by genealogy.[310] According to E.S.C. Handy, there were traditionally three basic classes of people, plus the King (who was of course ranked above everyone else).[311] Just below the King were the *ali'i,* who were chiefs and

[307] Kenneth Emmory. "Navigation." Ancient Hawaiian Civilization. (Honolulu, The Kamehameha Schools Press, 1933.), 243.
[308] Davianna McGregor. Personal Interview. 24 September 2007.
[309] Ibid.
[310] E.S. Craighill Handy. "Government and Society." Ancient Hawaiian Civilization. Honolulu: The Kamehameha Schools Press, 1933), 36.
[311] Ibid., 31

other members of royalty.[312] Below the *ali'i* were the majority of all others, known as the *maka'ainana,* who were the laboring masses.[313] The lowest class was the *kauwa*, who had no rights to land or other rights, and were often the victims of human sacrifice when it was called for by the gods.[314] The most important thing to note is that this class system which the society abided by was hereditary and directly tied to one's ancestry.

The cultural theme of ancestral ties is also apparent in the belief in family gods, or *'aumakua*, which was previously discussed. These *'aumakua* are the direct ancestors of Hawaiians, and tie their personal ancestry to the gods.[315] *'Aumakua* and other ancestors were called upon during times of sickness, for food, for forgiveness, and for help with troubles.[316] This shows the belief that Hawaiians are direct descendants of the gods and that their passed ancestors have a continuing effect on the lives of the living,[317] thus further demonstrating the importance of ancestry in traditional Hawaiian culture.

5.3.5 Lifecycle Events

Another major Hawaiian cultural theme is that of lifecycle events.[318] Lifecycle events were very important to the people, and celebrated accordingly. In the life of a person, certain milestones were celebrated to honor this lifecycle. These important events were birth, the one-year birthday, passage into adulthood, marriage, one-year

[312] E.S. Craighill Handy. "Government and Society." Ancient Hawaiian Civilization. Honolulu: The Kamehameha Schools Press, 1933), 32.
[313] Ibid., 31.
[314] E.S. Craighill Handy. "Government and Society." Ancient Hawaiian Civilization. Honolulu: The Kamehameha Schools Press, 1933), 32.
[315] Kamakau, Samuel Manaiakalani, and Mary Kawena Pukui, trans. Na Hana o Ka Po'e Kahiko: The Works of the People of Old. Honolulu: Bishop Museum Press, 1974), 28.
[316] Ibid., 30.
[317] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 170.
[318] Davianna McGregor. Personal Interview. 24 September 2007.

anniversary, and death.[319] Each of these events had specific ceremonies involved with them. For example, at birth, the placenta was saved and buried, often planting a tree over the top.[320] Quite often, there was also a special place where the umbilical cord would be buried.[321] This is just one example, but it demonstrates how the circle of life was not only observed, but celebrated.

This circle of life was apparent in other aspects of the culture as well.[322] For example, the traditional thought processes and views on history were not necessarily viewed in a linear fashion such as is the case in Western societies. Rather than history being linear, it is seen by Hawaiians as taking more of a circular path, with naturally occurring events repeating themselves over and over again.[323] This, again, is a process which is difficult for Westerners to understand, but something that is very common among Polynesian cultures. This belief, along with the movement of the celestial bodies and lifecycles of plants, animals, and the land, demonstrate how life is seen as a cyclical, which most definitely has an effect on traditional Hawaiian culture.

5.4 MOST UNIQUE ASPECTS OF CULTURE

5.4.1 Agriculture Practices

One of the most unique elements of traditional Hawaiian culture is the agricultural practice that was developed.[324] Although sweet potatoes and bananas were also intentionally grown, the cultivation of *kalo* (taro) was one of the most agriculture

[319] Davianna McGregor. Personal Interview. 24 September 2007.
[320] Ibid.
[321] Ibid.
[322] Ibid.
[323] Ibid.
[324] Ibid.

practices in the entire Pacific.[325] *Kalo* was grown in dry land patches in elevated lands, and in wet land patches in fields and valleys (*figure 9*).[326] It was not foraged from naturally found patches, but intentionally grown and cultivated using very advanced techniques.[327] Hawaiians understood how to enrich the soil and treat it in a manner that would not destroy its value.[328] They had also developed means of cross-breeding *kalo* plants to create better food crops.[329]

In order to cultivate wet land *kalo*, terraces were built across the land (*figure 10*).[330] These terraces could be found in virtually every valley in all of Hawaii that had at least one stream.[331] These terraces required immense grading and building up of the land, which took much time and dedication not only from the planters, but also from their *'ohana* and the entire community.[332] These terraces were then irrigated using very elaborate water engineering techniques to bring water in to *lo'i* (wet land *kalo* patch) and never let it out.[333] This was accomplished through the use of irrigation ditches and aqueducts, and special methods of compacting the terrace soil to make it water tight.[334] Hawaiians also used halved and hollowed bamboo as a trough for carrying water from

[325] Davianna McGregor. Personal Interview. 24 September 2007.
[326] Julie Rice Wichman. "Agriculture." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 113.
[327] Julie Rice Wichman. "Agriculture." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 113.
[328] Ibid., 109.
[329] Davianna McGregor. Personal Interview. 24 September 2007.
[330] Julie Rice Wichman. "Agriculture." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 113.
[331] Davianna McGregor. Personal Interview. 24 September 2007.
[332] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 25.
[333] Julie Rice Wichman. "Agriculture." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 113.
[334] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 26.

one terrace to the next.[335] This system of cultivating *kalo* was most definitely unique to Hawaiians, and one of the most unique aspects of the culture.

5.4.2 Aquaculture Practices

Another unique aspect of traditional Hawaiian culture is the practice of aquaculture.[336] The methods which were used here to cultivate fish were not found anywhere else in Polynesia.[337] One of the ways this cultivation occurred was through salt-water fish ponds, which were built of dry-stacked stone and extended from shore out into the ocean (*figure 11*).[338] They were built strongly for permanence so that they could withstand storms and tsunamis.[339] Although these ponds were very unique, their function was really quite simple. Basically, there was a gate which was opened and closed with the tides, capturing fish for later harvesting inside the pond.[340] The ponds were then tended to ensure that no predators would be allowed to remain inside and kill of the population.[341]

Another aquaculture technique which was unique was the use of freshwater fish ponds.[342] Freshwater fish ponds were typically created in conjunction with a wetland *kalo* patch, which was possible because the *kalo* required a constant minimum level of

[335] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 26.
[336] Davianna McGregor. Personal Interview. 24 September 2007.
[337] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 26.
[338] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 256.
[339] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 26.
[340] Caroline Curtis. Life in Old Hawaii. (Honolulu: The Kamehameha Schools Press, 1970), 256.
[341] Ibid.
[342] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 26.

water to grow.[343] This is not only a demonstration of a unique Hawaiian aquaculture practice, but also a demonstration of the Hawaiian understanding of the circle of life and natural processes. The plants provided the water with nutrients that were essential to the survival of the fish. In return, the fish provided fertilization of the soil which allowed the *kalo* to flourish. It was a very efficient way of cultivating food which was not done anywhere else in Polynesia.[344]

5.4.3 Centrality of 'Ohana

The centrality of the *'ohana* is another facet of traditional Hawaiian culture which is very unique.[345] Family life is important in most cultures, but the central role that the family plays in everyday life is really quite unique in Hawaii. Literally translated, *'ohana* refers to the offshoots of a *kalo* plant (*figure 12*).[346] When applied to humans, the word means "offshoots from a common stock."[347] An *'ohana* is an extended family which includes grandparents, all of their children, all of the grandchildren, and any other directly related relatives.[348]

The uniqueness of the *'ohana* concept is demonstrated by their views on children. All of the grandchildren of a set of grandparents are seen as brothers and sisters, and not necessarily cousins.[349] Also, when babies were born, they were often given to relatives, either grandparents or aunts and uncles, to be reared and educated

[343] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 94.
[344] Ibid, 26.
[345] Davianna McGregor. Personal Interview. 24 September 2007.
[346] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 289.
[347] Ibid.
[348] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 167.
[349] Ibid.

and loved.[350] This concept of adoption by another family member, referred to as *hanai*, was a common practice in traditional Hawaii. Children weren't given away because the parents could not care for them (as would typically be the case in modern-day adoption), but instead as a means of showing loyalty and love to the family. This view that all children of an *'ohana* are brothers and sisters, regardless if they would even be 13th or 14th cousins in contemporary terminology, is an example of how important family is to the Hawaiian people.

According to Pukui, the *'ohana* "is a sense of unity, shared involvement, and shared responsibility. It is a mutual interdependence and mutual help. It is emotional support, given and received. It is solidarity and cohesiveness. It is love – often; it is loyalty – always. It is all this, encompassed by the joined links of a blood relationship."[351] This is yet another example of how important the *'ohana* is to Hawaiian people, and how this inter-family relationship is probably more important than in most other cultures.

The *'ohana*, in addition to providing an emotional bond, also has a functional bond that is very unique. First of all, an *'ohana* physically lives with and adjacent to each other.[352] Immediate family members may share a *kauhale* (traditional Hawaiian house complex) (*figure 13*), and extended members of the clan will live in adjacent *kauhale*.[353] The *'ohana* lived together, worked together, played together, ate together, and relied upon one another for their sustenance.[354] The *'ohana* served as the social, economical, and educational structure of one's life.[355] Within the *'ohana*, there was a definite social hierarchy which ran the family and made the important decisions, and the authority of

[350] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 49.
[351] Ibid., 171.
[352] Ibid., 288.
[353] Ibid., 169.
[354] Davianna McGregor. Personal Interview. 24 September 2007.
[355] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 167

the *'ohana* senior was clearly recognized and obeyed.[356] Basically, the *'ohana* had a large impact on the way in which people lived - the extent of which is very unique to Hawaii.

5.4.4 Land Division

Another unique aspect of Hawaiian culture was the land division system.[357] Within an island, the major type of land division was known as an *ahupua'a.*[358] An *ahupua'a* is a strip of land that extends from the summit of a mountain through a valley and into the sea (*figure 14*).[359] The boundaries on the side of the *ahupua'a* district were marked by fixed natural features, which created a clear-cut line between the districts.[360] An *'ili* is a smaller subdivision of an *ahupua'a*, which would be a narrow strip of land that extended the full length of the *ahupua'a*.[361] Occasionally, there would also be *'ili lele*, which were not contiguous strips of land, but small pieces of land in each different climactic and agricultural zone that functioned together as one unit.[362]

This unique type of land division system had a very specific function. It was divided this way so that everything needed for sustaining life could be found within the

[356] Mary Kawena Pukui and E.W. Haertig and Catherine A. Lee. Nana I Ke Kumu. (Honolulu: Queen Liliuokalani Children's Center, 1972), 169-170.
[357] Davianna McGregor. Personal Interview. 24 September 2007.
[358] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 148.
[359] Kamehameha's Hawaiian Studies Institute and The Kamehameha Schools Press. The Ahupua'a. (Honoloulu: The Kamehameha Schools/Bernice Pauahi Bishop Estate, 1982), xi.
[360] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 49.
[361] Ibid.
[362] Ibid., 49-50.

singular district.[363] Every *ahupua'a* included fishing lands, cultivable lands, and upland timber and planting zones.[364] By dividing the land in this manner, a completely self-contained community could be maintained, as long as the spirit of caring for the land and sharing were followed.[365]

There was also another reason for this type of land division which had its roots in the political system.[366] As part of the *Makahiki* festival, which was previously discussed, taxes were collected annually. The *ahupua'a* system created a clear land division which allowed the King to collect taxes and offerings from the people.[367] At the beginning of the *Makahiki* festival, *kahunas* would go around the island, stopping at the marker of each *ahupua'a* to collect this offering. The *ahupua'a* was named after this boundary marker, which when literally translated, is a pig on an altar, thus the *ahupua'a* boundary was marked with stone platform with the head of a pig carved of wood.[368]

The traditional land division system, being the *ahupua'a* system, was an extremely efficient means of using the land. It ensured that every individual would be sustained, forced *'ohanas* and communities to work together, and provided a political division which made the collection of taxes and offerings possible. This type of land use system is very unique and not found anywhere else besides Hawaii.

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[363] Kamehameha's Hawaiian Studies Institute and The Kamehameha Schools Press. The Ahupua'a. (Honoloulu: The Kamehameha Schools/Bernice Pauahi Bishop Estate, 1982), xi.

[364] E.S. Craighill Handy and Elizabeth Green Handy and Mary Kawena Pukui. Native Planters in Old Hawaii: Their Life, Lore, and Environment. (Honolulu: Bishop Museum Press, 1972), 48.

[365] Project Ahupuaa. 13 October 2000. Hawaii State Department of Education. 12 October 2007. <http://www.k12.hi.us/~ahupuaa/>

[366] Kamehameha's Hawaiian Studies Institute and The Kamehameha Schools Press. The Ahupua'a. (Honoloulu: The Kamehameha Schools/Bernice Pauahi Bishop Estate, 1982), xi.

[367] Ibid.

[368] Handy, E.S. Craighill. "Feasts and Holidays." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 61.

5.5 TRADITIONAL CRAFTS AND ARTS

5.5.1 Traditional Buildings

Traditional Hawaiian buildings, known generically as *hale* (*figures 15-17*), can be classified by one of two means – either their construction type or their functional type. By first taking a look at their construction types, there are five main classifications. The first of which is a *hale* without walls, which is basically a gable roof, sometimes with a slight upward curve, that is sitting directly on the ground. The second type is a *hale* with stone walls. This type of *hale* is very similar to the first, except the roof is sitting atop low stone walls, which were typically about 1/3 the height of the total structure. Next, there is a *hale* with a gable roof and thatched walls. In this case, the walls would be constructed of timber and thatched similarly to the roof. The fourth type of *hale* is a raised gable roof with no walls, which was basically a gable roof that was simply lifted off the ground on poles. The fifth type of *hale* based upon construction type was the *hale* on piles. In this case, there would be a timber structure floor raised above the ground, essentially taking the entire *hale* and lifting it up on piles. No buildings of this last type have been found either intact or in ruins, but several were drawn by an artist who traveled with Captain Cook on his third voyage to the Hawaiian Islands.

Classifying *hale* by their functional type is not quite as cut and dry, as there were many different functional types of *hale*. Buildings were not divided into rooms, and instead every different type of functional space had its own *hale*. They were usually organized into a *kauhale*, which is a family complex of buildings. Some *'ohanas* would have more buildings than others, and some types were set apart and shared by the community. All *kauhale* would have a sleeping house, and sometimes more than one if there was a large extended *'ohana* living in one complex. Most would also have a

cooking house, and eating house, a men's house, and a women's house, all of which had their own specific use. Some *'ohanas* would have their own canoe house, while other times they would be shared. There were also *heiau*, which had more of a religious function, and were shared and used by entire communities. The important thing to note is that there was a building for every unique function that was required.

The materials used for construction mainly consisted of stone (*figure 18)*, wood timbers and smaller members, cordage, and thatching. The stone was usually lava rock, but sometimes coral stones were also used. Stones were used for foundations, platforms, and low walls, and provided both a solid foundation materials and an excellent means of draining water away from the timber members to avoid rot. The large wooden members, which were the poles, wall plates, rafters, and ridge poles, were typically made from *'ohia* wood, but would sometimes be made of wood from other large trees if *'ohia* was not available. The smaller wooden members, being the structural purlins, thatch purlins, and support rods, were always made from the same type of wood as the larger structural members. The cordage which was used to lash all of the elements together was made from weaving and braiding either coconut or banana fibers. The thatching was typically made from *pili* grass, but was also sometimes made from pandanus leaves, *ki* leaves, or even more rarely banana leaves.

The traditional *hale* is constructed using very precise and sophisticated methods of lashing and wood joints. The most unique element of the Hawaiian *hale* is the joint which connects the vertical pole to the wall plate and the rafter (*figure 19*). The joint includes a male/female joint between the pole and the rafter with the wall plate sandwiched between. It is then all lashed together in a prescribed manner which includes the use of special lashing notches. This type of joint is not found anywhere else in Polynesia. Every piece and part is lashed together in an exact way which follows centuries of traditional and expert building knowledge. The result is a building which,

when completely finished, is very solid and able to withstand some of the strongest forces of nature. The construction joints, lashing, and thatching, although created for functional purposes, also have the added side-effect of creating very beautiful and intricate patterns and details (*figure 20*).

5.5.2 Canoes

The building of canoes is another traditional craft which is important to traditional Hawaiian culture (*figure 21*). Canoes were important because they gave allowed transportation between and around the islands for both war-like and peaceful reasons.[369] They were also important for making long distance sailing journeys across the Pacific, which is what allowed various migrations over time.[370] Canoes were also important to day-to-day life as they were a tool for fishing and harvesting food from the sea.[371]

Canoes were built in two basic types. The first of these types was the single-hull canoe with an outrigger.[372] This type was the most common, as it was usually somewhat small and easier to maneuver within the bays of the islands.[373] There were also double-hull canoes, which had a second hull in place of the outrigger.[374] These canoes were larger, steadier in the ocean, and could carry more people and cargo, but were much more difficult to handle and steer.[375] Supposedly, there was also a third type, the triple-hull canoe, which was attempted to be built by Kamehameha I, but it

[369] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 253.
[370] Ibid.
[371] Ibid.
[372] Ibid.
[373] Ibid., 255.
[374] Ibid., 255.
[375] Ibid., 255.

never became popular.[376] It also was probably not introduced until after contact,[377] and therefore not part of the traditional culture as it is defined for this project.

There were three basic materials used in making canoes, which are wood, cordage, and pandanus leafs.[378] The hull of the canoe was built out of a large tree trunk, which was hollowed out and pointed at the ends.[379] There were also attachments on the sides and ends, known as *mo'o* (gunwale strakes), which added height to the canoe for both function and ornamentation.[380] All of the accessories of the hull, which included the *mo'o* as well as others, were attached by means of lashing with cordage made from either banana or coconut fibers.[381] Booms were attached to the hull by this same method, the other ends of which would either be attached to another hull or an outrigger, depending on the type of canoe.[382] The hull would be finished by polishing it with a rubbing stone, sometimes painting with a black charcoal and oil mixture, and shining with kukui nut oil.[383] The mast was made from a large wooden pole which extended from the hull.[384] The sail was then attached to the mast. The sail had an inverted triangular shape similar to other Polynesian sails, but had a final form which was unique and found nowhere else.[385] Sails were typically made from plaited pandanus leaves, and sometimes had unique geometrical patterns woven in during their making.[386]

[376] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 253.
[377] Ibid., 255.
[378] Ibid., 256-282.
[379] Ibid., 256.
[380] Ibid., 253.
[381] Ibid., 260.
[382] Ibid., 269-272
[383] Ibid., 257-258
[384] Ibid., 274.
[385] Ibid., 282.
[386] Ibid., 282.

5.5.3 Weaving / Plaiting

Another traditional craft which is important to traditional Hawaiian culture is weaving and plaiting. Plaiting was typically accomplished by weaving strands of pandanus leaves together in the form of mats (*figure 22*).[387] Although pandanus was the preferred material, sometimes other materials were used.[388] Intricate patterns were used in creating the mats, usually taking on a geometric form,[389] and special attention was placed creating the corners and edges of the mats.[390] The fineness and level of detail varied, depending upon the purpose, but in general, Hawaiian mats and weaving are considered to be some of the finest in all of Polynesia.[391]

Weaving of pandanus leaves had many practical uses. Most commonly, the woven mats were used for flooring and sleeping mats.[392] Several different layers of sleeping mats were used when creating a bed, with the finest mats being closest to the body. This finest level of weaving and detailing was exhibited in *makaloa* mats, and required much skill to make.[393] The woven mats were not restricted to use on the floors, though, as there were several other uses. Sails of the canoes were also made of woven pandanus leaves (*figure 23*).[394] Pillows, shaped into the form of a cube, were also made using this same technique.[395] Occasionally, weaving was also used for clothing, although *kapa* was a much more common material for this purpose.[396] Basically, the

[387] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 111.
[388] Ibid.
[389] Ibid., 120.
[390] Ibid., 111.
[391] Ibid., 130-132.
[392] Ibid., 111.
[393] Ibid., 111
[394] Ibid., 282.
[395] Ibid., 135.
[396] Ibid., 165-166

weaving of pandanus leaves has a multitude of uses and is an important craft in traditional Hawaiian culture.

5.5.4 Kapa

Kapa, which is a traditional bark cloth also known as *tapa*, is a craft important to Hawaiian culture. Bark cloth in various forms is found all over the world in traditional cultures, and is especially prevalent in cultures of the Pacific.[397] Hawaiians had more varieties and textures of bark cloth, and a higher quality, than any other place in Polynesia.[398] There are many different varieties of *kapa* which had many different uses,[399] however it was most commonly used for making clothing, such as the *malo* (men's covering) and the *pa'u* (women's skirt).[400]

Kapa was made from wood fibers, mostly breadfruit trees, paper mulberry trees, and the outer skins of banana tree trunks, and mixed together with sticky sap from tree ferns and other plants.[401] These products were then beaten and pounded together to form the bark cloth.[402] A very wide variety of textures, patterns, and grooves were created using wooden and stone tools (*figure 24*).[403] This was done mostly for decorative purposes, and is a tradition which is unique to Hawaiian culture.[404] Beaters were used to create depressions in the surface of the *kapa* (*figure 25*), and sometimes with the use of natural pigments and dyes made from different types of plants.[405]

[397] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 166.
[398] Ibid.
[399] Ibid., 167.
[400] Ibid., 165.
[401] Ibid., 167-169.
[402] Ibid., 167.
[403] Ibid., 171-185
[404] Ibid., 166.
[405] Peter H. Buck. Arts and Crafts of Hawaii. (Honolulu: Bishop Museum Press, 1957), 171-187.

Because of its use as clothing, as well as its occasional use for other ceremonial purposes, *kapa* is a craft which plays a significant role in traditional Hawaiian culture.

5.5.5 Tattoos

Tattoos are a form of traditional art which have significant meaning to the Hawaiian culture.[406] Traditionally, *ali'i* were the predominant bearers of tattoos, but commoners also tattooed their skin at times. Tattooing was done for a few different reasons.[407] First of all, tattoos were a way of receiving *mana,* and there were specific religious protocols that were performed both leading up to and after receiving the tattoo. Hula dancers often received tattoos for aesthetic purposes, although they still had embedded meaning and were not purely decoration. Most of the time, tattoos were a symbol of a person's identity. The tattoos would be representative of the island and specific area where people came from and their ancestors lived, with the markings serving as representations of their land and genealogy. The patterns might also be reflective of their particular trade or occupation.

The tattoos took on the form of geometric patterns (*figure 26*).[408] The patterns would be the same as the patterns found on the *kapa* that they wore, as both were representations of their home and genealogy. Every shape and the way in which they were oriented and placed on the body had a meaning, and it was possible that a shape had more than one meaning. An example of a common shape used would be the triangle. A triangle often referred to mountains, and its repetition, the placement on the body, and its orientation may refer to a specific homeland. Another example would be that a semi-circular half moon shape may refer to the hull of a canoe, signifying that the

[406] Ikaika Bantolina. Personal Interview. 15 October 2007.
[407] Ibid.
[408] Ibid.

person came from a tradition of fisherman. Regardless of the shape and repetition, all patterns had a specific meaning and told a story about the person bearing the tattoo.

Tattoos were created by tapping two specialized sticks together.[409] One stick would have needles made of human bones attached to it and was held against the skin. This was a means of transferring *mana* to the individual receiving the tattoo. The other stick was used to repeatedly tap the end of the needled stick, driving it into the skin. This process was very functional, but also symbolic of the way in which patterns which carried the same meaning were pounded into *kapa* (*figure 27*).

5.6 PROJECT SPECIFIC RESEARCH

5.6.1 Traditional Educational System

Although the traditional Hawaiian education system was vastly different from Western forms of education, there were still formalized avenues upon which it existed.[410] Most of the formalized education was based upon apprenticeship-style learning.[411] It was the belief that one would learn best by watching and physically doing.[412] This is known in Hawaiian as "*ma ka hana ka 'ike,"* or "through work comes knowledge."[413] Even after one had gained enough experience to "do" on their own, they would continue to learn through their life experiences.[414]

The canoe-building traditions provided a good example of how this system worked. Hawaiians have developed a method for building canoes which has been

[409] Ikaika Bantolina. Personal Interview. 15 October 2007.
[410] Davianna McGregor. Personal Interview. 24 September 2007.
[411] Maile Andrade. Personal Inerview. 09 October 2007.
[412] Davianna McGregor. Personal Interview. 24 September 2007.
[413] Davianna McGregor. Comments during interim project review. 07 December 2007.
[414] Davianna McGregor. Personal Interview. 24 September 2007.

tested and improved over a long period of time.[415] Those who were the recognized experts in building the canoes were called *kahuna kalaiwa'a.*[416] A *kahuna kalaiwa'a* would teach his sons, and possibly his friends' sons, how to build canoes.[417] They would work under him for a long period of time until they were fully capable of building canoes on their own. This was not a short process, and could possibly take decades to teach every detail and practice it to an absolute perfection.[418] At this point, those who had sufficiently learned would become *kahuna kalaiwa'a* themselves, continue to build canoes, and commit to teaching their sons just as they had been taught.[419] It is in this way that the traditional educational system worked, and that traditions, skills, and crafts were passed along from one generation to the next.[420]

Another interesting example of the traditional educational system comes from the *hula halau*, which is a *hula* school where specific training was received (*figure 28*).[421] In a sense, it was a form of higher education, as those who entered the *hula halau* were already known for their dancing skill.[422] The *halau* was a special school where a specific dance was created and taught for a specific occasion, such as the birth of a king's child or for *Lono* during the *Makahiki*[423]. During this time, the dancers and the musicians were isolated and placed under strict *kapu*.[424] At the end of the training, they would be physically, mentally, and spiritually prepared for the *hula* which they are to perform.[425]

[415] Handy, E.S. Craighill. "Religion and Education." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 52.
[416] Handy, E.S. Craighill. "Religion and Education." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 52.
[417] Ibid.
[418] Ibid.
[419] Ibid.
[420] Ibid.
[421] Ibid.
[422] Ibid.
[423] Ibid.
[424] Ibid.
[425] Ibid.

When they reached this point, a special ceremony takes place to honor the achievement.[426]

It is also believed that there were traditionally other forms of higher education in Hawaii.[427] Unfortunately, not much is known about this because much of the information was lost with the passing of the *kahunas*.[428] However, much is known about the traditional higher education system of the Maori in New Zealand, and it is believed to have been very similar in Hawaii.[429] For the Maori, the higher education was reserved for the sons of chiefs.[430] They would gather around a fire or in a special house, and learn about astronomy, the heavens, gods, history, genealogy, and the religious aspects of war, health, and self-protection.[431] This type of learning was more intellectual and analytical than vocational, and thus reserved for special people and kept very secret. Although it cannot necessarily be proven, it is assumed that a similar system was used in Hawaii.[432]

[426] Handy, E.S. Craighill. "Religion and Education." Ancient Hawaiian Civilization. (Honolulu: The Kamehameha Schools Press, 1933), 52.
[427] Ibid.
[428] Ibid.
[429] Ibid., 52-53.
[430] Ibid., 53.
[431] Ibid., 53.
[432] Ibid., 53.

5.7 FIGURES CITED

Figure 1: Carved image of Hawaiian god (http://www.paulwaters.com/images/gods2.jpg)

Figure 2: Hawaiian carved image with shell inlaid eyes (http://the.honoluluadvertiser.com/dailypix/2004/Nov/16/localnews15_b.jpg)

Figure 3: *pole carried by kahuna at beginning of Makahiki festival* (http://starbulletin.com/2004/12/20/features/art2a.jpg)

Figure 4: Hale currently being constructed on island of Kaho'olawe (photo by author)

Figure 5: ʻawa plan used for medicinal purposes (http://www.canoeplants.com/img/awa-photo.jpg)

Figure 6: fish pond (http://z.about.com/d/gohawaii/1/0/x/x/east_molokai_38.JPG)

Figure 7: painting of a traditional Hawaiian canoe (http://www.samlow.com/sail-nav/images/KaneImage.jpg)

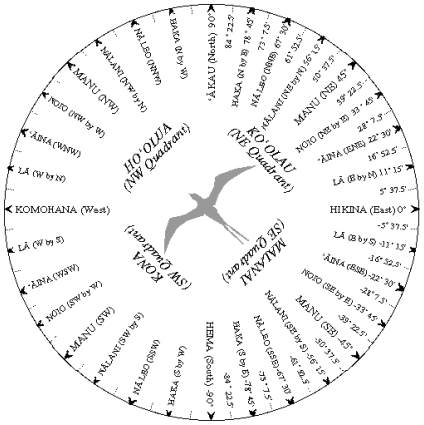

Figure 8: contemporary drawing of traditional astronomical map (http://pvs.kcc.hawaii.edu/rapanui/compass.gif)

Figure 9: patch of *kalo* plants (http://www.slowfoodhawaii.org/pics/P1010409_waipio%20taro_02.jpg)

Figure 10: terraces used for growing kalo (http://www.dkimages.com/discover/previews/988/50198252.JPG)

Figure 11: sea wall of a fish pond (http://www.magiccarpetjournals.com/hawaii/fishpond_s.jpg)

Figure 12: several offshoots of a single taro plant (http://www.getarthere.com/artists/wj/BlackMagicTaro.jpg)

Figure 13: several *hale* forming a *kauhale* (http://www.hookele.com/hccm/kauhale.gif)

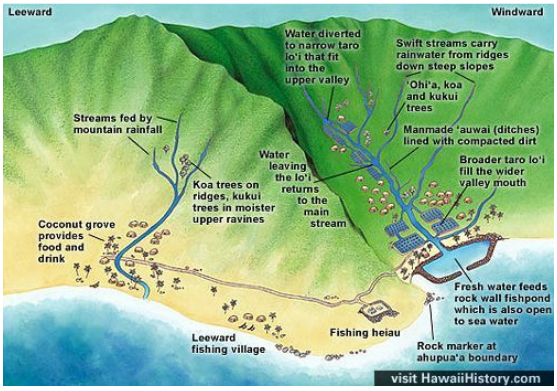

Figure 14: diagram of an *ahupua'a*(http://oceanworld.tamu.edu/resources/oceanography-book/Images/ahupuaa.jpg)

Figure 15: hale at Pu'uhonua o Honaunau (photo by author)

Figure 16: hale at Pu'uhonua o Honaunau (photo by author)

Figure 17: hale at Puʻuhonua o Honaunau (photo by author)

Figure 18: stones remnants of ancient hale (photo by author)

Figure 19: connection joint in hale which is unique to Hawaii (photo by author)

Figure 20: pattern created on inside of hale by purlins and lashing system (photo by author)

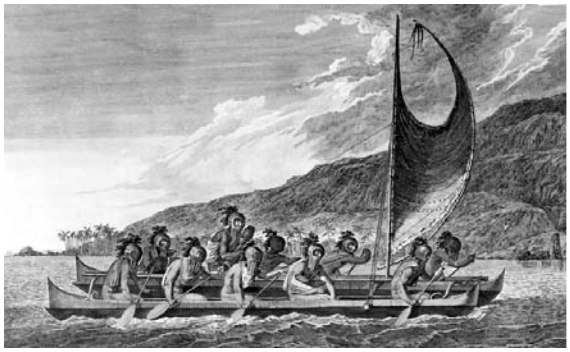

Figure 21: drawing of a traditional Hawaiian canoe (http://www.flickr.com/photos/67108153@N00/509718833/sizes/o/)

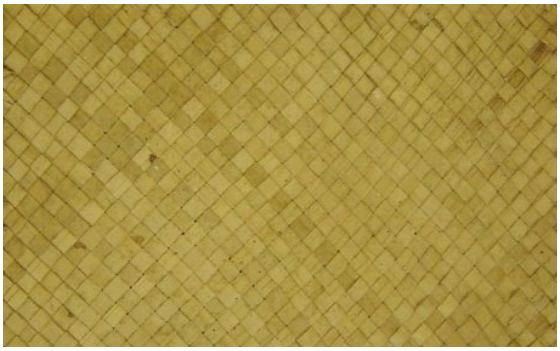

Figure 22: traditionally woven mat (http://www2.bishopmuseum.org/ethnobotanydb/images/lauhala_mat_C_1125.jpg)

Figure 23: woven pandanus mats being used as a sail (http://www.aloha.net/~vaka/images/fig07.jpg)

Figure 24: kapa with patterns (http://thethemeroom.com/images/Hawaiiangolden1.JPG)

Figure 25: kapa beater (http://pics.davesgarden.com/pics/Islandshari_1186453235_696.jpg)

Figure 26: traditional styled tattoo (http://l.yimg.com/www.flickr.com/images/spaceball.gif)

Figure 27: person being tattooed in traditional method (http://the.honoluluadvertiser.com/dailypix/2001/Aug/05/islandlife_b.jpg)

Figure 28: hula halau (http://www.moolelo.com/huiaipohaku/halau.jpg)

Chapter 6 | Current Trends in High School Design

6.1 INTRODUCTION TO CURRENT TRENDS IN HIGH SCHOOL DESIGN

6.1.1 Introduction to Current Trends in High School Design

The focus of this doctoral project is not the design of high schools. It is about a methodology for using contemporary design as a tool for cultural preservation. The design of a high school is how this methodology is being applied and demonstrated. However, in order for the project to be relevant to the field of architecture, the Cultural Design Methodology must be applied so that the building being designed meets all of the needs of that particular function and building typology. If not, the methodology is useless and the building will not be functional. As is the case with all fields of design, the design of high schools is vastly changing to support the latest theories within the industry. This is why steps have been taken to learn about and understand the latest trends in high school design. The three most significant trends which were discovered are discussed and documented below.

6.2 CENTER OF COMMUNITY ACTIVITIES

6.2.1 Community Role in Education

Communities play a very important role in the education system. First of all, public schools are funded by taxpayer dollars.[433] The initial cost of building schools has become extremely expensive in recent years. A few decades ago, state-of-the-art

[433] Weekes, John. Telephone Interview. 15 October 2007.

schools could be built for only a few million dollars.[434] Today, the construction of many new schools is running upwards of one hundred million dollars.[435] Costs of schools do not stop when construction ends however, as there is always a continuous need for new books and education materials, teacher and staff salaries, and regular operations and maintenance costs, all of which may cost schools millions more each year.[436] Almost all of this money, at least in the case of public schools, comes from taxpayer dollars from those living in the communities which the schools are located.[437] Therefore, there is an inherent investment in the school by the local community.

A second role that the community plays in the education system is that of the educators.[438] Teachers are members of the community, but more than that, much of a child's education comes from sources outside of the school grounds. Students learn from their families, museums, public libraries, cultural and community centers, and other organizations within the community.[439] They represent the future of the community, so everybody has a vested interest. The community is therefore part of the education system and should also be a part of the school system.

6.2.2 Community Programs

Because of the growing need and desire for community involvement in the school system, high school administrators are often allowing the facilities to be used for

[434] Weekes, John. Telephone Interview. 15 October 2007.
[435] Ibid.
[436] Ibid.
[437] Ibid.
[438] Ibid.
[439] Ibid.

community programs.[440] The buildings are becoming a resource for the entire community, and not just those who are students and their families.[441] Most often, the facilities are being used for recreational and cultural activities, but are also being used for other forms of community education and organizational meetings and events.[442]

This has an effect on how spaces need to function.[443] In existing schools, these community activities are being accommodated for by making the best of what is available, but the spaces are not always ideal.[444] When designing new high school facilities, a current trend is to design them to be multi-use facilities, which is accomplished through flexibility.[445] Flexibility has many facets which range from designing spaces to be completely transformational to simply using moveable furniture.[446] In some cases, community centers are being designed completely in conjunction with the high school.[447] For example, a community aquatic center may be built on campus with the intention of serving the public, and the high school has access to it for its physical education classes and athletics programs. This is a much better solution than designing for school use only, and then possible allowing public access on the weekends, and the community program was an original part of the design and therefore better able to accommodate everyone's needs.[448] This idea is being applied to

[440] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. p35.
[441] Ibid.
[442] Weekes, John. Telephone Interview. 15 October 2007.
[443] Ibid.
[444] Ibid.
[445] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. p35.
[446] Weekes, John. Telephone Interview. 15 October 2007.
[447] Ibid.
[448] Ibid.

all aspects of high school facilities, so that each and every space is designed to have multiple uses by both the school system and the community as a whole.[449]

6.2.3 Partnership

Another solution to involving the community is partnership with local businesses and organizations.[450] This is similar to involving community programs, except that the partnership is coming from a private entity instead of the community or government. This allows community involvement, and may also provide a source of income for the school.[451] One example of private entity partnership comes from a school in the Minneapolis school district in Minnesota.[452] One particular school is partnered with a local YMCA, and the two share athletic facilities.[453] This same school also shares facilities with a local public library.[454] Both of these are ways that the high school facilities have become centers for community activity. There is another school in Minnesota known as the "Zoo School."[455] This is a public school which shares facilities with the Minnesota Zoo.[456] The school benefits from this partnership through hands-on learning opportunities with the animals and other zoo operations. The zoo benefits by getting help from the students and using school facilities for their own programs when not in use for high school educational purposes. It is a mutual relationship which in enjoyed by the high school, the zoo, and the community as a whole.

[449] Weekes, John. Telephone Interview. 15 October 2007.
[450] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. p35.
[451] Weekes, John. Telephone Interview. 15 October 2007.
[452] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. p36.
[453] Ibid.
[454] Ibid.
[455] Ibid., 37.
[456] Ibid., 37.

6.3 PLACES OF LEARNING

6.3.1 Learning Space vs. Teaching Place

Schools of the past have were typically designed to be teaching places.[457] Today, the current trend is to instead make them learning spaces.[458] At first glance, these two may seem to be one in the same, but they are in reality quite different. A teaching place is designed around the needs of high school administrators and teachers, whereas a learning space is designed around the needs of students.[459] A teaching place is a building or campus facility which is organized around moving students to and from classrooms, whereas a learning place considers the entire school a learning environment.[460] Learning spaces are designed holistically so that the entire facility provides the best possible opportunities for educating the students.[461] This trend towards creating learning spaces is the current trend in education theory, and having an immense impact on the way in schools are designed.[462]

6.3.2 Small School Environment

One way in which schools are being designed as learning spaces is through creating small school environments.[463] It has been discovered that students who are enrolled in smaller schools have much more successful and fulfilling educational

[457] Weekes, John. Telephone Interview. 15 October 2007.
[458] Ibid.
[459] Ibid.
[460] Ibid.
[461] Ibid.
[462] Ibid.
[463] Ibid.

experiences.[464] Students in this type of environment are able to create better relationships with the teachers and with their fellow students, as they see the same group of people more often and get to know them better.[465] An example of this comes from a Providence Rhode Island School district known as "The Met." This was originally a relatively large school, but was recently broken down into six smaller schools.[466] The results were realized almost immediately, as the dropout rate dropped by two-thirds, the absentee rate dropped by two-thirds, and the suspension rate is only 1/18 of the average for other schools in Providence.[467]

Building many more schools can be very costly, however, and not all communities can afford this. A current trend in high school design is solving this problem by creating "schools within schools."[468] At these schools, major facilities such as the gymnasium, auditorium, cafeteria, and athletic fields, are shared by the entire school.[469] The classrooms and teachers offices, however, are subdivided into smaller groups or pods.[470] Students and teachers stick with their particular pod for all of their classes.[471] Student lockers and teacher offices are also located within the pod. The students stay with the same group of peers and teachers for the entire year, and possibly their entire high school career.[472] This allows them to have the small school experience and gain most of the advantages of this type of environment while at the same time saving the school district from having to pay for many different sets of entire school facilities.

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[464] Weekes, John. Telephone Interview. 15 October 2007.
[465] Ibid.
[466] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. P29.
[467] Ibid.
[468] Ibid., 37.
[469] Weekes, John. Telephone Interview. 15 October 2007.
[470] Ibid.
[471] Ibid.
[472] Ibid.

6.3.3 Agile and Nimble Facilities

Designing agile and nimble spaces is another trend that helps in the creation of learning spaces.[473] The term *flexible* is often used, but this conjures images moving furniture or simply using the same space for more than one function.[474] *Agile* and *nimble,* however, refers to the space itself being easily transformable to meet learning needs.[475] This is important for community use as was previously discussed, but also helps to create a better learning space.

Corridor space is one example of how spaces are being created to be agile and nimble. In typical high schools of the past century, class rooms and other functions are lined up along long corridors which are used completely as a means of transportation.[476] In locations with more moderate climates, such as is the case in Hawaii, this usually takes place outdoors, but the function is largely the same. In an agile and nimble school, the typical corridor is eliminated from the design of the building.[477] Corridor spaces are extensions of the classrooms and other learning spaces. It may even be a learning space of its own which just happens to serve the double function of a travel space between class periods.[478] This agility and nimbleness of the space allows it to accommodate different learning situations which may not always be best learned in a typical classroom,[479] and also allows space to be conserved by not using it for one

[473] Weekes, John. Telephone Interview. 15 October 2007.
[474] Ibid.
[475] Ibid.
[476] Ibid.
[477] Ibid.
[478] Weekes, John. Telephone Interview. 15 October 2007.
[479] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. P29.

function only. Another benefit is that when the space is being used for travel, it is still serving the function of a learning environment and not just a long corridor.[480]

Technology is also requiring that spaces be agile and nimble.[481] It is obvious that technology is having a dramatic effect on the way in which high schools function and how students learn. A mistake can easily be made which focuses the design of a high school facility around a particular technology or what is considered "high-tech" at the time of design.[482] This however, will lead to bad results, as technology is usually outdated before construction is even completed.[483] Creating a facility which is agile and nimble, as opposed to designing for a specific technology, solves this problem.[484] This agile space allows for schools which are always able to update themselves with the latest and greatest technology without making costly renovations to the facilities.[485]

6.4 HEALTHY ENVIRONMENTS

6.4.1 Light and Ventilation

Adequate natural lighting and proper ventilation will provide measurable results on student performance, attendance, and behavior.[486] There have been many different

[480] Weekes, John. Telephone Interview. 15 October 2007.
[481] Ibid.
[482] Ibid.
[483] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. P23.
[484] Weekes, John. Telephone Interview. 15 October 2007.
[485] Ibid.
[486] American Architectural Foundation and KnowledgeWorks Foundation. "Report From the National Summit on School Design: A Resource for Educators and Designers." American Architecture Foundation. 2006. p43.

studies which have demonstrated and proven this point.[487] It has become a fairly simple fact that daylight improves performance, and indoor air quality improves health.[488] Mold and airborne toxins are also a problem, causing an increase in the number children with asthma.[489]

This research and its results has led to a growing trend amongst high school designers to allow for natural lighting and ventilation in every single space within schools, and improved mechanical systems, air filters, and purifiers which reduce toxins and mold.[490] This has a large impact on the way in which the facility is designed, as the "big box" style of high schools doesn't allow for this. It requires that the design take advantage of the natural features of a site, and fully incorporate the concepts of passive design.[491] It also means that better systems of mechanical ventilation and electrical lighting must also be used when the natural versions aren't accessible.[492]

6.4.2 Safety and Security

Part of creating a healthy environment is creating one that is safe and secure. There are many different threats to students of contemporary high schools which were not as prevalent in years of past.[493] School shootings have been occurring more often today than ever in the past, child predators are in the news more often, and more people have access to the school facilities due to the increasing involvement with the

[487] "Healthy Places to Learn." BuildingGreenSchools.org. 2007. Building Green Schools. 19 October 2007. <http://www.buildinggreenschools.org/gs101/index.html>
[488] Ibid.
[489] Ibid.
[490] Weekes, John. Telephone Interview. 15 October 2007.
[491] Ibid.
[492] Ibid.
[493] Ibid.

community.[494] Because of this, high schools now require a level of security that was simply not needed in the past.[495] School officials feel the need to monitor and have control over every individual who enters the facilities and what they have with them.[496] This has tremendous implications on the design of school buildings. They must now have controlled access points and cannot simply be open for anyone to enter the grounds or the buildings. New high schools are also including security cameras and metal detectors, which need to be appropriately designed. Basically, these new security issues have changed how an entire high school facility and its grounds are accessed by both the students and the general public.[497]

6.4.3 Environmental Stewardship

Designing a healthy learning environment also implies that the school should act as a steward for environmental responsibility. The health of the natural ecosystem has a tremendous impact to our individual health, and the school facility itself has an impact on this ecosystem. Therefore, in order for a high school to provide a healthy learning environment, it must also be friendly towards the natural environment. This eco-friendliness is commonly referred to as sustainability. It has become a very common trend in high school design to create facilities which are as sustainable as can possibly be.[498] Most of us who are members of the building industry are now aware of the impact that our decisions can and do make the world's environment. The resulting movement

[494] Weekes, John. Telephone Interview. 15 October 2007.
[495] Ibid.
[496] Ibid.
[497] Ibid.
[498] Ibid.

towards sustainable design has impacted virtually every type of architectural design, and high schools are not an exception.[499]

6.5 CONCLUSION

6.5.1 Conclusion

Continuing changes in educational theory and the practice of architecture have combined and led to new trends in the design of high school facilities. There are undoubtedly countless new ideas and concepts that are being studied and tested around the country. The trends that have been documented here are intended to be encompassing of larger general trends within this niche of the design industry, and are not intended to cover every detail. Again, the purpose of the design portion of this project is to implement the methodology for using contemporary architectural design as a tool for cultural preservation. Understanding and acknowledging the current trends in high school design ensures that the implementation of this methodology is relevant to the field of architecture.

[499] Weekes, John. Telephone Interview. 15 October 2007.

Chapter 7 | Project Site Selection

7.1 INTRODUCTION TO THE SELECTION OF THE PROJECT SITE

7.1.1 Introduction to the Selection of the Project Site

The goal of the design portion of this project is to implement the Cultural Design Methodology into the design of a high school where the design itself acts as a tool for the preservation of the traditional Hawaiian culture. After completing the cultural research and understanding the latest trends in the particular building typology, the next phase of this project is to start implementing the methodology into an architectural design. Before this can begin, however, an appropriate project site must be selected. This means first choosing the school complex (similar to a district in most states) where the design project will take place, and then choosing the physical site where the school will be located. Several criteria were used in the selection of both the district and the site. These criteria, along with the selections of the school district and site, are described and documented in this section of the paper.

7.2 SELECTION OF THE SCHOOL COMPLEX

7.2.1 School Complex Selection Criteria

Because the school facility being designed is to serve as a replacement of an existing school complex, the first step is finding a school complex where a new facility which will serve as a tool for cultural preservation would be most appropriate. This could take place anywhere in Hawai'i as the entire chain of islands is culturally significant and has historical meaning. However, it seems to make the most sense that the facility be

designed in a school district with a large Hawaiian population, one that will be sustained in both the current time and into the future. One source used to determine which complexes may be most suitable based upon this criterion is the Department of Hawaiian Home Lands (DHHL). This state government department oversees lands that have been set aside for homesteading by Native Hawaiians.[500] Lands that have been designated DHHL are a good indicator of where there may be a larger population of Native Hawaiians. The second source used to determine areas which have a high percentage of Native Hawaiians is the United States Census Bureau. This is the most reliable source, however it classifies Hawaiian ethnicity by "Native Hawaiian or other Pacific Islander," so does not necessarily give a completely accurate demographic picture.

The second criterion used to select the school complex was high school and college graduation rates within local neighborhoods. These graduation rates are often indicators of the effectiveness of the local schools. If a school complex is doing a great job at educating its students and providing a good environment for learning, there is a better chance that the students will remain in high school, graduate, and continue to a college or education. If not, the opposite is probably true. For this project, a neighborhood which does not have a high level of high school and college graduates would be a good choice, as that is a sign that the school complex needs to change the way it is educating its students and provide a better space for learning.

The third criterion used to select an appropriate school complex was income levels. Like graduation rates, income levels can be an indicator of how successful the local school complex has been at educating the students. This is not to say a student

[500] "Hawaiian Homelands." Wikipedia, The Free Encyclopedia. 02 Dec 2006. Wikimedia Foundation, Inc. 30 October 2007. <http://en.wikipedia.org/w/index.php?title=Hawaiian_Homelands&oldid=91508726>.

who earns more money necessarily has received a better education, but in general terms, students who receive a better education are better equipped to earn a higher income. A neighborhood with below average income levels is therefore a possible indication that the school complex is not able to provide the same quality of education as other schools. This could be a result of many different factors, and the school facilities are one possible culprit. Creating new state-of-the-art facilities is one way of creating better learning opportunities and ultimately a better education.

7.2.2 Chosen School Complex

The school complex chosen for this project is the Wai'anae complex. The newly designed facilities will serve as the new high school for the communities of Wai'anae and Makaha. This selection was made after looking into the criteria above, and choosing a complex within Hawai'i which best fit the criteria.

First of all, there are DHHL lands located within the Waianae school complex. According to the 2000 United States Census, there are over 1500 people with Native Hawaiian ancestry living on DHHL lands in the Wai'anae complex, which is amongst the highest of any complex in the state.[501] This is a good indication that the Hawaiian population will remain within the complex for a long period of time. The Census also indicates that 27% of the Waianae community has Native Hawaiian ancestry, and the number in Makaha is about 22%.[502] These percentages are relatively high compared to

[501] "State of Hawaii Data Book 2006." Hawaii.gov. 2007. State of Hawaii. 28 October 2007. <http://www.hawaii.gov/dbedt/info/economic/databook/db2006/>

[502] "American FactFinder." U.S. Census Bureau Online. 2000. United States Federal Government. 28 October 2007. <http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=waianae&_cityTown=waianae&_state=04000US15&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010&show_2003_tab=&redirect=Y>

other areas on O'ahu such as Kaneohe with 11% and Honolulu with 7% being Native Hawaiian.[503]

The Wai'anae complex is also a good choice based upon the other selection criteria. The average per capita annual income in Wai'anae is barely above $13,000, and almost 20% of individuals falling below the federal poverty level.[504] In Makaha, the average per capita annual income is just over $12,000 and more than 36% of individuals are living in poverty.[505] High School and college graduation rates for those living within the complex are also extremely low. Only about 75% of adults living in the complex have a high school diploma, and less than 20% have graduated from college, both rates are amongst the lowest in the state.[506]

7.3 SELECTION OF THE PROJECT SITE

7.3.1 Project Site Selection Criteria

Once it was determined that the Wai'anae school complex would be the location of the design project, the next step was to find a site which would be appropriate for building a new school which would serve as a tool for preservation of the Hawaiian culture. There were several different criteria which were heavily weighted in making this decision.

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[503] American FactFinder." U.S. Census Bureau Online. 2000. United States Federal Government. 28 October 2007. <http://factfinder.census.gov/servlet/SAFFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=waianae&_cityTown=waianae&_state=04000US15&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010&show_2003_tab=&redirect=Y>

[504] Ibid.

[505] Ibid.

[506] "Hawaii School District Demographics." ProximityOne.com. 2007. Proximity. 28 October 2007. < http://proximityone.com/hidmi2.htm>

The first criterion is proximity to the student population. The school complex is to serve the communities of both Wai'anae and Makaha, so it should definitely be located somewhere within the bounds of those two communities. This is important for a couple of reasons. First of all, travel time and distance are important. Traffic congestion is already an issue in the area, so moving the school facility out of the communities would only make this situation worse. Travel time is also important for reasons of convenience, as a school which is located too far away will impede on the willingness of students and their families to participate in school activities. Thirdly, locating the school district will help to create a "center of community" around the school, which is one of the current trends in high school design as discussed previously in this project.

The second criterion used to select the project site is available space. A school complex requires a very large amount of space to accommodate all of the necessary facilities. This could be accomplished by buying and demolishing existing space in the center of the community, but this would not be a good approach as it would diminish public support and potentially destroy areas of contemporary or historical cultural importance. Another option would be to building on the existing school site, but this is also not a good idea because this project would require complete demolition and not allow for a place to hold classes during the demolition and construction phases, which would most likely take several years. The other option is simply finding a large open space which is currently undeveloped. This is the best option, but not easily found.

The third criterion was finding a space with favorable natural features. This is important for two reasons. The first is that a space with significant natural features would be better equipped for incorporating traditional cultural ideas into the development of the site. As was discussed previously in this project, traditional Hawaiian buildings were almost always built near or centered around natural geographic features that carried some sort of significance. A site with significant natural features is also important

for sustainability reasons. Sustainability is not the focus of this project, but preserving the ecosystem is important culturally. Therefore, a site which will offer sustainable development opportunities is important to the success of this project.

7.3.2 Chosen Project Site

The project site which was selected is located in Makaha Valley. It is on the Western side of the valley near the mouth, about a half mile away from the ocean, between Kili Road and the mountain which creates the valley wall (see the following maps/images). This site was chosen because of its open space for building, its unique natural features, and its proximity to the student population. Although a majority of the student population will be coming from Waiʻanae, there is not a significant amount of open space available for building an entire high school facility within the community. For this reason, Makaha Valley was chosen, which has much more open space. Because the site is located near Farrington Highway (the major vehicular thoroughfare), there is easy access to the site. Creative mass transportation methods may still be necessary, however, due to the fact that it is not within walking distance from Waiʻanae neighborhoods. In addition to the large amount of open space, the site has a wealth of natural features which will provide excellent cultural and sustainable development opportunities. There are other limitations, such as a lack of existing infrastructure and potential drainage issues, but the strengths of the site made it the best candidate within the Waiʻanae school complex.

7.3.3 Maps / Images of Project Site

Figure 1: Project Site Aerial Map[507]

Figure 2: Enlarged Project Site Aerial Map[508]

[507] Image from Google Earth.
[508] Ibid.

Figure 3: Project Site Photo (photo by author)

Figure 4: Project Site Photo (photo by author)

Figure 5: Site Photo (photo by author)

Figure 6: Site Photo (by author)

Figure 7: Site Photo (by author)

Figure 8: Site Photo (by author)

Figure 9: Site Photo (by author)

Figure 10: Site Photo (by author)

Chapter 8 | Architectural Program

8.1 Architectural Program

Waianae High School Facilities Design Program

Space	Sqft	Qty.	Total			Type of Space
PODS						
Classroom Pods						
Class Rooms	650	10	6500	x9	58500	Enclosed
Laboratory Class Rooms	1000	2	2000	x9	18000	Enclosed
Outdoor Class Rooms	1000	2	2000	x9	18000	Outdoor
Computer Lab	1200	1	1200	x9	10800	Enclosed
Server Room	200	1	200	x9	1800	Enclosed
Lockers	1500	1	1500	x9	13500	Semi-Enclosed
Shared Faculty Offices	1000	1	1000	x9	9000	Enclosed
Restroom - Kane	250	1	250	x9	2250	Enclosed
Restroom - Wahine	250	1	250	x9	2250	Enclosed
Vending	100	1	100	x9	900	Semi-Enclosed
Janitor's Closet	80	1	80	x9	720	Enclosed
Storage	150	1	150	x9	1350	Enclosed
Mechanical Room	800	1	800	x9	7200	Enclosed
Electrical Closet	50	1	50	x9	450	Enclosed
total - 1 Pod			**16080**			
total - All Pods					**144720**	
SHARED FACILITIES						
Athletic Facilities						
Large Gymnasium						
Large Gym (sub-div into 2)	12000	1	12000			Enclosed
Storage	500	1	500			Enclosed
Mechanical Room	1000	1	1000			Enclosed
Electrical Closet	100	1	100			Enclosed
Ticketing Office	200	1	200			Semi-Enclosed
Concessions	200	1	200			Semi-Enclosed
Restrooms - Kane	300	1	300			Enclosed
Restrooms - Wahine	300	1	300			Enclosed
Smaller Gymnasium						
Small Gym	3000	4	12000			Enclosed
Storage	250	2	500			Enclosed
P.E. Locker Rooms						
Lockers	2000	2	4000			Enclosed

Showers	350	2	700	Enclosed
Toilets	250	2	500	Enclosed
Lavatories	200	2	400	Enclosed
P.E. Office	150	2	300	Enclosed
Laundry	200	2	400	Enclosed
Small Storage	100	4	400	Enclosed
Athletics Locker Rooms				
Lockers	1500	2	3000	Enclosed
Gathering Space	300	2	600	Enclosed
Showers	350	2	700	Enclosed
Toilets	250	2	500	Enclosed
Lavatories	200	2	400	Enclosed
Laundry	200	2	400	Enclosed
Coaches Offices	350	2	700	Enclosed
Seasonal Storage	250	2	500	Enclosed
Small Storage	100	4	400	Enclosed
Football Field (w/ stands)				
Football Field	72000	1	72000	Outdoor
Stands	10000	1	10000	Outdoor
Ticketing	200	1	200	Semi-Enclosed
Concessions	200	1	200	Semi-Enclosed
Restroom - Kane	300	1	300	Enclosed
Restroom - Wahine	300	1	300	Enclosed
Track & Field				
Track	40000	1	40000	Outdoor
Field Events Space	20000	1	20000	Outdoor
Equipment Storage	400	1	400	Enclosed
Ball Fields				
Baseball Field	130000	1	130000	Outdoor
Softball Field	110000	1	110000	Outdoor
Dugout	250	4	1000	Semi-Enclosed
Stands	3000	1	3000	Outdoor
Stands	2500	1	2500	Outdoor
Restrooms - Kane	300	1	300	Enclosed
Restrooms - Wahine	300	1	300	Enclosed
Ticketing	200	1	200	Semi-Enclosed
Concessions	200	1	200	Semi-Enclosed
Practice Field				
Practice Field	72000	1	72000	Outdoor
Batting Cage	15000	1	15000	Outdoor
Equipment Storage	400	1	400	Enclosed
Aquatics				
Lap Pool (incl deck space)	15000	1	15000	Semi-Enclosed

Diving Pool (incl deck space)	6000	1	6000	Semi-Enclosed
Small Locker Room - Kane	1200	1	1200	Enclosed
Small Locker Room - Wahine	1200	1	1200	Enclosed
Storage	200	1	200	Enclosed
Office	200	1	200	Enclosed
Concessions	150	1	150	Semi-Enclosed
Ticketing	150	1	150	Semi-Enclosed
Stands	2000	1	2000	Semi-Enclosed
Restroom - Kane	250	1	250	Enclosed
Restroom - Wahine	250	1	250	Enclosed
total			**545900**	
Cafeteria				
Cafeteria	3500	1	3500	Enclosed
Faculty/Staff Dining	800	1	800	Enclosed
Kitchen				
Prep Space	800	1	800	Enclosed
Cook Space	800	1	800	Enclosed
Serving Space	800	1	800	Enclosed
Frozen Storage	300	1	300	Enclosed
Cold Storage	300	1	300	Enclosed
Dry Storage	300	1	300	Enclosed
Equipment Storage	300	1	300	Enclosed
Restroom - Kane	250	1	250	Enclosed
Restroom - Wahine	250	1	250	Enclosed
Vending	150	1	150	Enclosed
total			**8550**	
Auditorium				
Seating Space	7000	1	7000	Enclosed
Stage	1000	1	1000	Enclosed
Dressing Room	250	2	500	Enclosed
Ticketing Office	200	1	200	Enclosed
Restroom - Kane	300	1	300	Enclosed
Restroom - Wahine	300	1	300	Enclosed
Restroom - Staff	80	1	80	Enclosed
Mechanical Room	800	1	800	Enclosed
Electrical Closet	200	1	200	Enclosed
Storage	200	1	200	Enclosed
total			**10580**	
Library				
Book Stacks	5500	1	5500	Enclosed

Reference Library	1000	1	1000	Enclosed
Computer Stations	700	1	700	Enclosed
Circulation Desk	200	1	200	Enclosed
Help Desk	150	1	150	Enclosed
Librarian Office	100	1	100	Enclosed
Librarian Work Room	200	1	200	Enclosed
Small Gathering Space	300	2	600	Enclosed
Listening / Viewing Rooms	300	2	600	Enclosed
Equipment & Storage Room	200	1	200	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff	50	1	50	Enclosed
Mechanical Room	600	1	600	Enclosed
Electrical Closet	80	1	80	Enclosed
total			**10280**	

Multi-Purpose / Gathering Spaces				
Outdoor Gathering Spaces	1000	2	2000	Semi-Enclosed
Indoor Gathering Spaces	1000	2	2000	Enclosed
total			**4000**	

Digital Arts				
Computer Lab	1200	2	2400	Enclosed
Server Room	150	1	150	Enclosed
Class Room	650	2	1300	Enclosed
total			**3850**	

Industrial Arts				
Auto Shop				
Shop Space	1200	1	1200	Enclosed
Equipment Storage	250	1	250	Enclosed
Wood Shop				
Wood Shop	1200	1	1200	Enclosed
Equipment Storage	250	1	250	Enclosed
Paint Booth	150	1	150	Semi-Enclosed
Welding Shop				
Welding Shop	800	1	800	Enclosed
Equipment Storage	200	1	200	Enclosed
Electronics Shop				
Electronics Shop	800	1	800	Enclosed
Equipment Storage	200	1	200	Enclosed
Design Studio				
Design/Drafting Studios	1200	1	1200	Enclosed

Equipment Storage	250	1	250	Enclosed
Class Rooms	650	2	1300	Enclosed
Computer Room	1000	1	1000	Enclosed
Shared Faculty Offices	500	1	500	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff	50	1	50	Enclosed
Small Locker Room				
Lockers	250	2	500	Enclosed
Showers	250	2	500	Enclosed
Toilets	75	2	150	Enclosed
Lavatories	75	2	150	Enclosed
Mechanical Room	1000	1	1000	Enclosed
Electrical Closet	200	1	200	Enclosed
total			**12150**	

Musical Arts				
Choir Room	1500	1	1500	Enclosed
Band Room	2000	1	2000	Enclosed
Practice Rooms	150	8	1200	Enclosed
Instrument Storage	500	1	500	Enclosed
Equipment Storage	250	1	250	Enclosed
General Storage	150	1	150	Enclosed
Shared Faculty Offices	300	1	300	Enclosed
Mechanical Room	400	1	400	Enclosed
Electrical Closet	80	1	80	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff	50	1	50	Enclosed
total			**6730**	

Classical Arts				
Studio Spaces	800	4	3200	Enclosed
Shared Faculty Offices	400	1	400	Enclosed
Ceramics Room	600	1	600	Enclosed
Kiln Room	250	1	250	Enclosed
Print Room	350	1	350	Enclosed
Dark Room	300	1	300	Enclosed
Supplies Room	350	2	700	Enclosed
Class Rooms	650	2	1300	Enclosed
General Storage	150	1	150	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed

Restroom - Staff	50	1	50	Enclosed
Mechanical Room	500	1	500	Enclosed
Electrical Closet	80	1	80	Enclosed
total			**8180**	

Hawaiian Arts				
Hale Construction Space	1500	1	1500	Semi-Enclosed
Wa'a Construction Space	1500	1	1500	Semi-Enclosed
Weaving / Plaiting Space	1000	1	1000	Semi-Enclosed
Kapa Making Space	1000	1	1000	Semi-Enclosed
Class Room Spaces	650	2	1300	Enclosed
Materials Storage	800	1	800	Enclosed
Shared Faculty Offices	500	1	500	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff	50	1	50	Enclosed
total			**7950**	

Agricultural Sciences				
Class Room	800	2	1600	Semi-Enclosed
Lo'i	5000	1	5000	Outdoor
Locker Room				
Shower	250	2	500	Enclosed
Lockers	250	2	500	Enclosed
Toilets	100	2	200	Enclosed
Lavatories	80	2	160	Enclosed
Shared Faculty Offices	500	1	500	Enclosed
Additional Garden Space	1000	4	4000	Outdoor
General Storage	500	1	500	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff	50	1	50	Enclosed
total			**13310**	

Administration				
School Office	3000	1	3000	Enclosed
Business Office	500	1	500	Enclosed
Principal's Office	200	1	200	Enclosed
Assistant Principal's Office	120	1	120	Enclosed
Counseling Offices	150	4	600	Enclosed
Athletics Director Office	120	1	120	Enclosed
Nurse / Medical Office	500	1	500	Enclosed
Storage	200	2	400	Enclosed

Staff Lounge	500	1	500	Enclosed
Staff Locker Room	800	2	1600	Enclosed
Restroom - Kane	150	1	150	Enclosed
Restroom - Wahine	150	1	150	Enclosed
Restroom - Staff - Kane	150	1	150	Enclosed
Restroom - Staff - Wahine	150	1	150	Enclosed
total			**8140**	

Facilities / Maintenance				
Central Mechanical Space	3000	1	3000	Enclosed
Central Electrical Space	500	1	500	Enclosed
Facilities Storage	1000	1	1000	Enclosed
Head Custodian Office	150	1	150	Enclosed
Custodian Lounge	400	1	400	Enclosed
Custodian Locker Room	800	2	1600	Enclosed
total			**6650**	

Parking Structure			
Staff and Visitor Parking	50 stalls	12500	Semi-Enclosed
Student Parking	250 stalls	62500	Semi-Enclosed
total	300 Stalls	**75000**	

AREA TOTALS	
Pods	144720
Shared Facilities	646270
Parking	75000

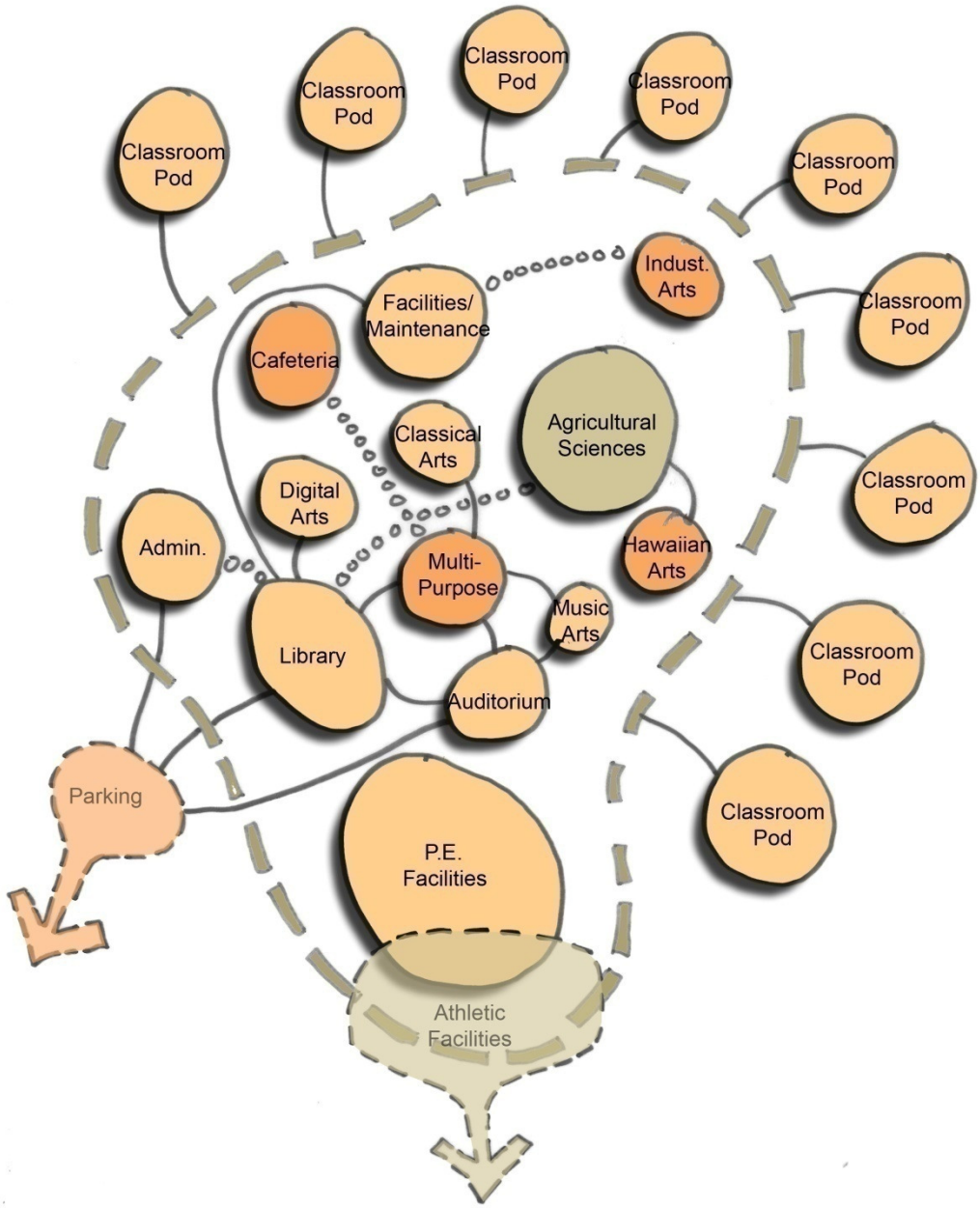
Enclosed Spaces	240840
Semi-Enclosed Spaces	48650
Semi-Enclosed Parking	75000
Outdoor Spaces	501500

Grand Total	**865990**

8.2 Adjacency Diagrams

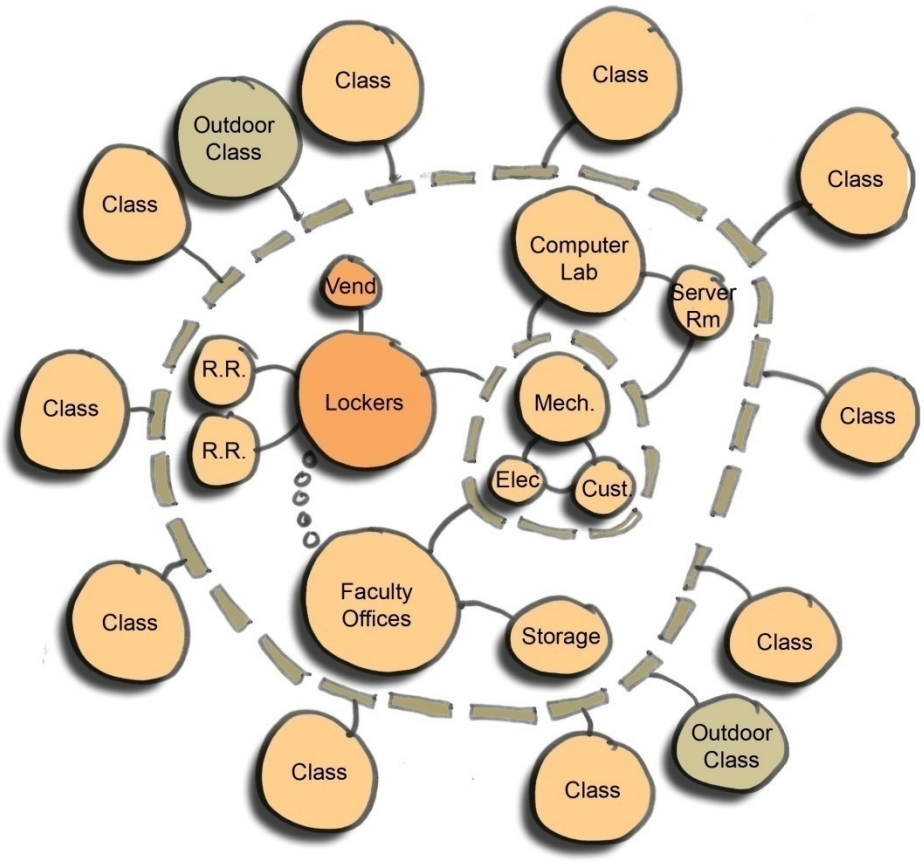
8.2.1 Waiʻanae School Campus

865,990 square feet



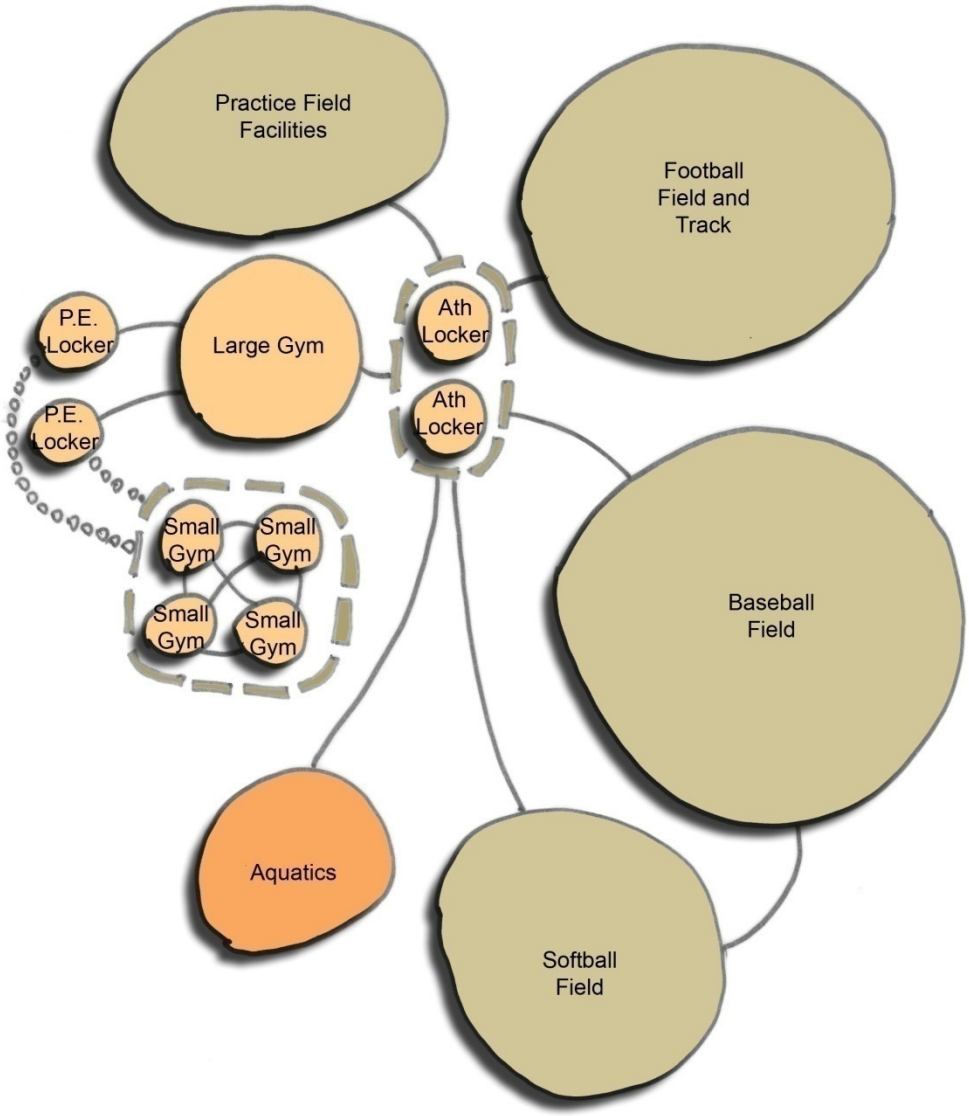
8.2.2 Classroom Pods (x9)

16,080 square feet



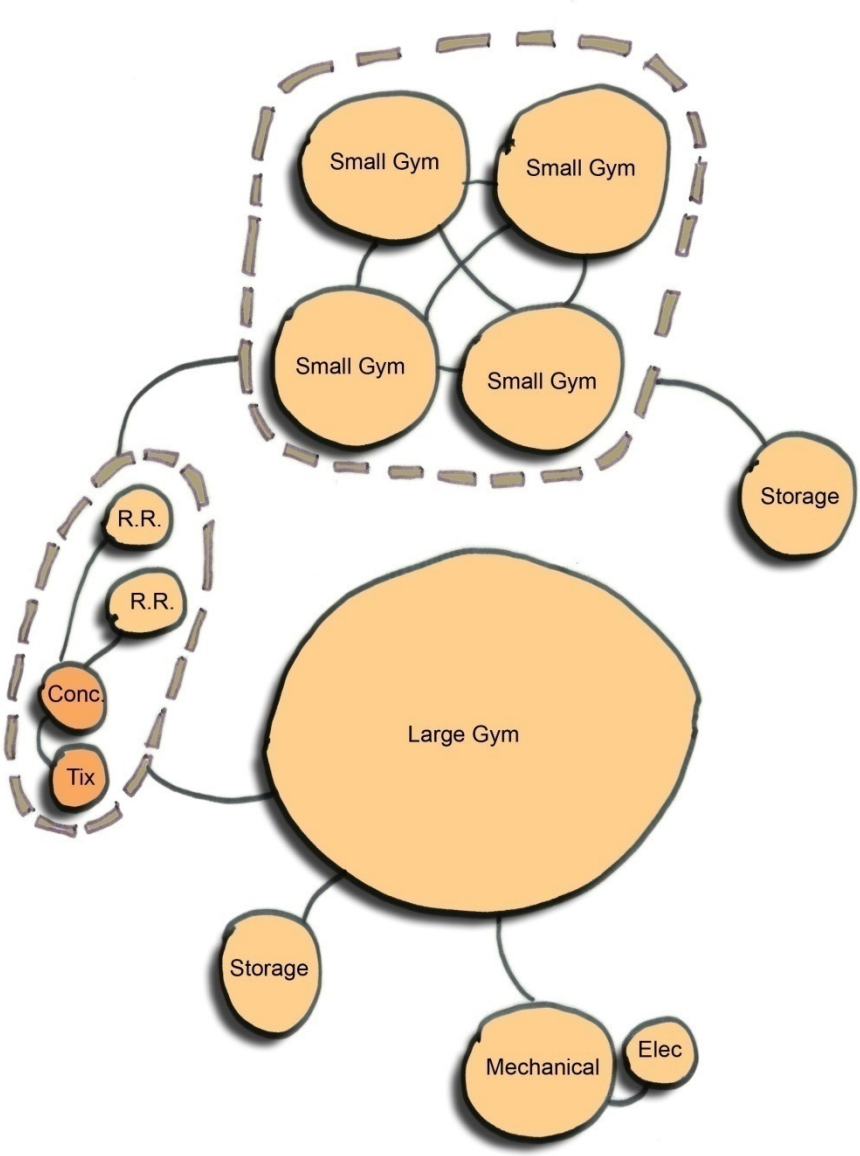
8.2.3 Athletic Facilities

545,900 square feet



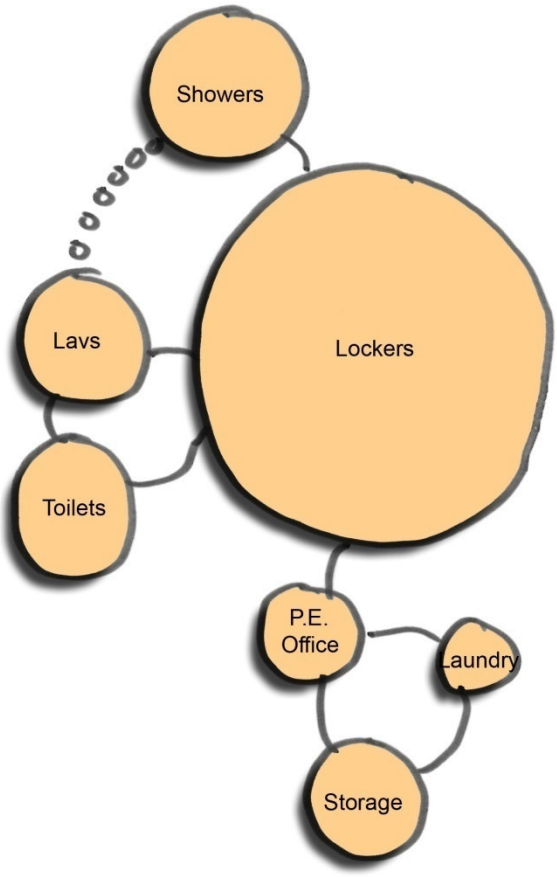
8.2.4 Gymnasium Facilities

27,100 square feet



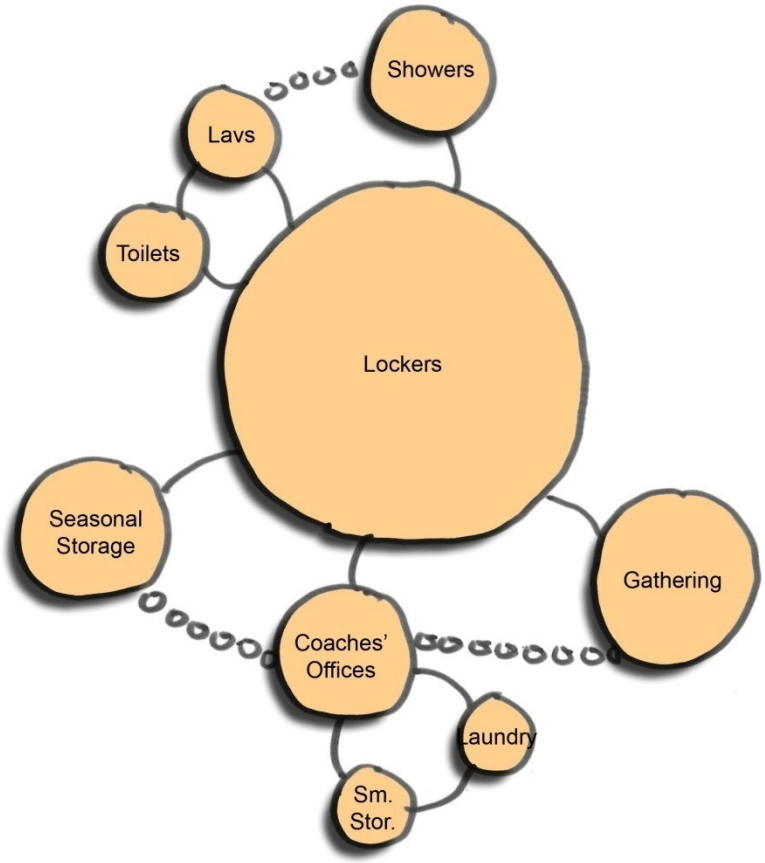
8.2.5 Physical Education Locker Rooms (x2)

6,700 square feet



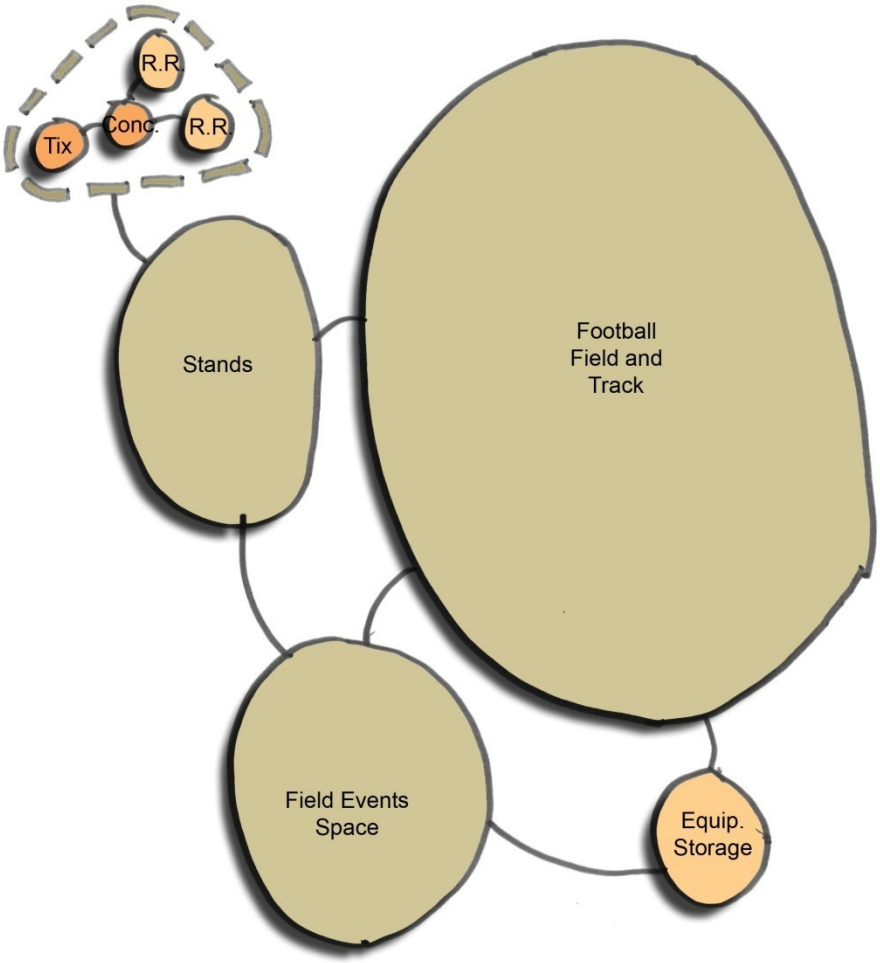
8.2.6 Athletic Locker Rooms (x2)

7,200 square feet



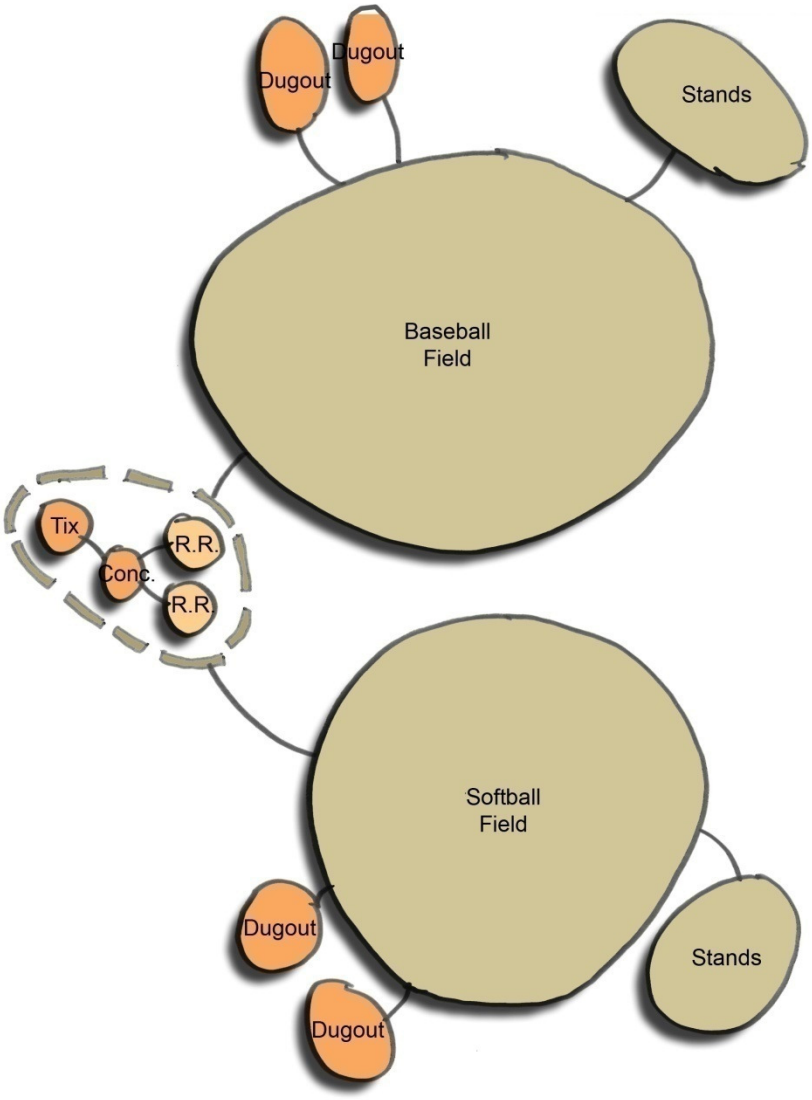
8.2.7 Football Field & Track

143,400 square feet



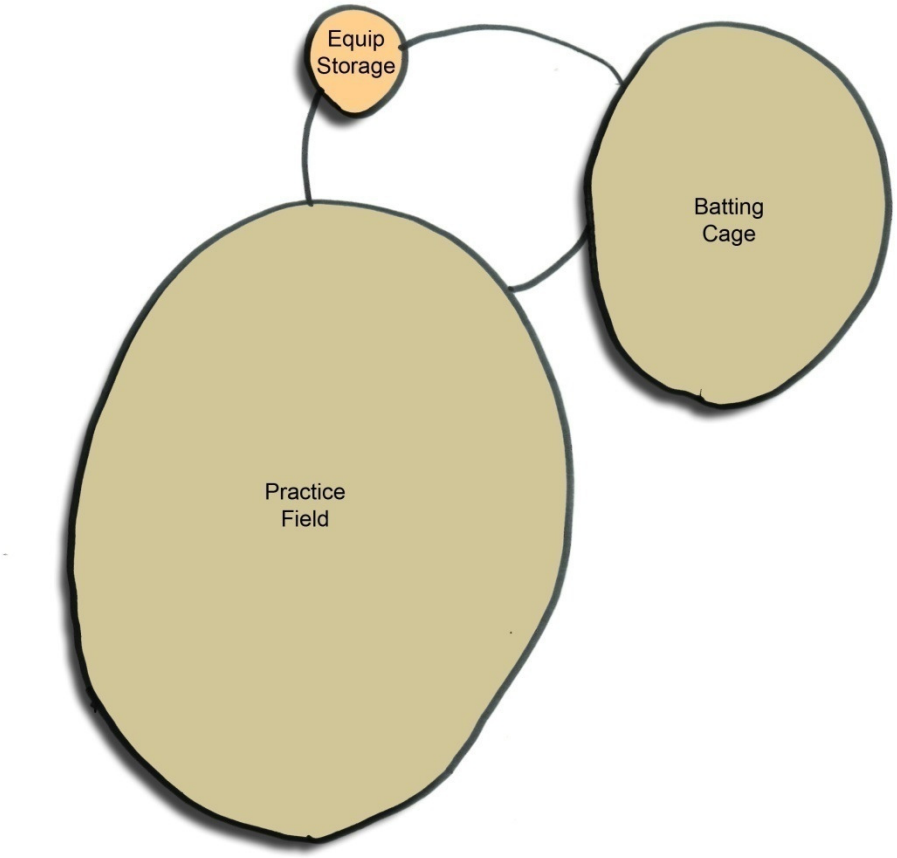
8.2.8 Ball Fields

247,500 square feet



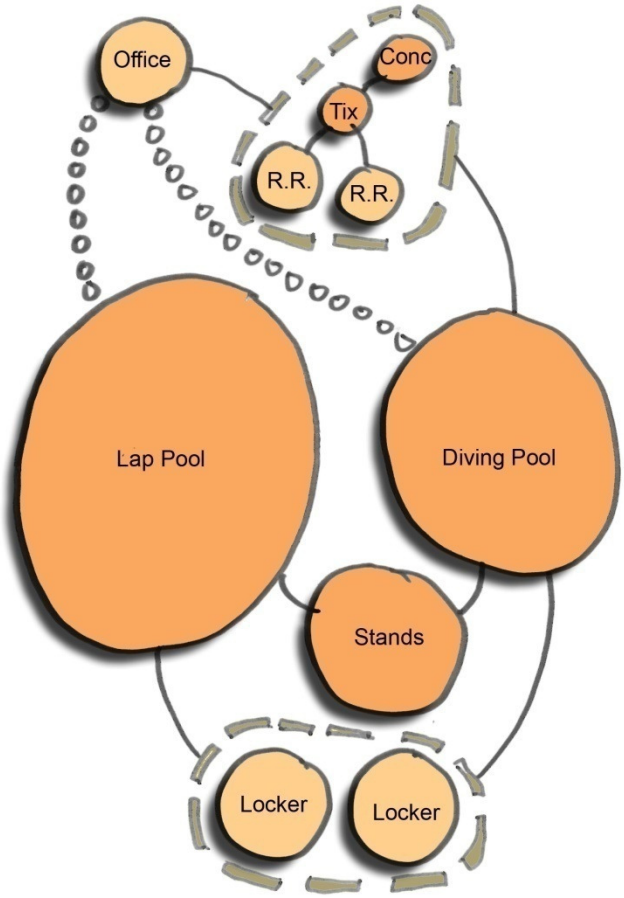
8.2.9 Practice Field Facilities

87,400 square feet



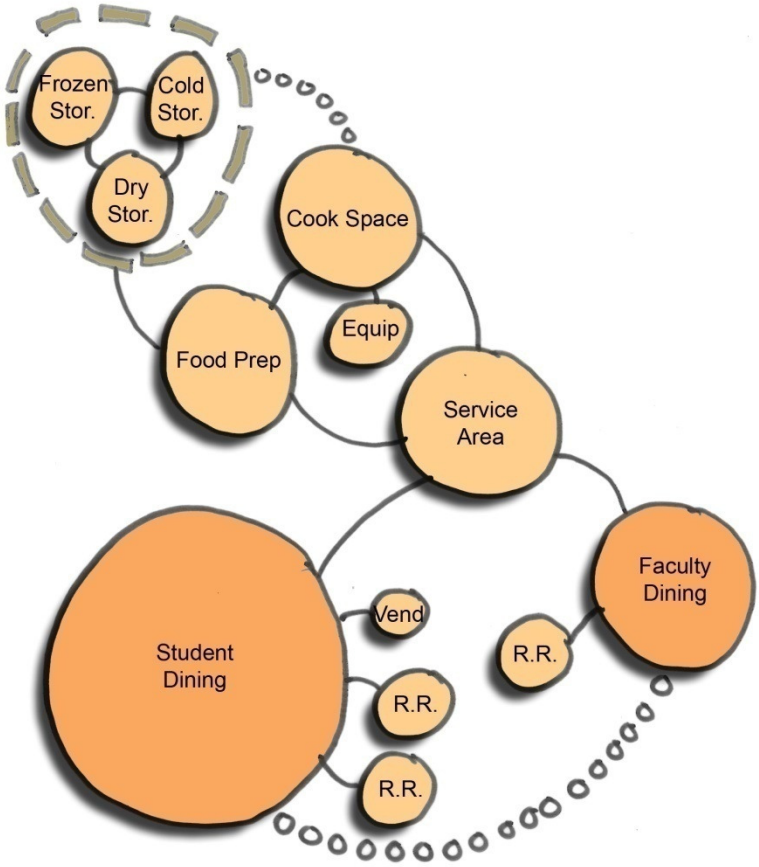
8.2.10 Aquatic Center

26,600 square feet



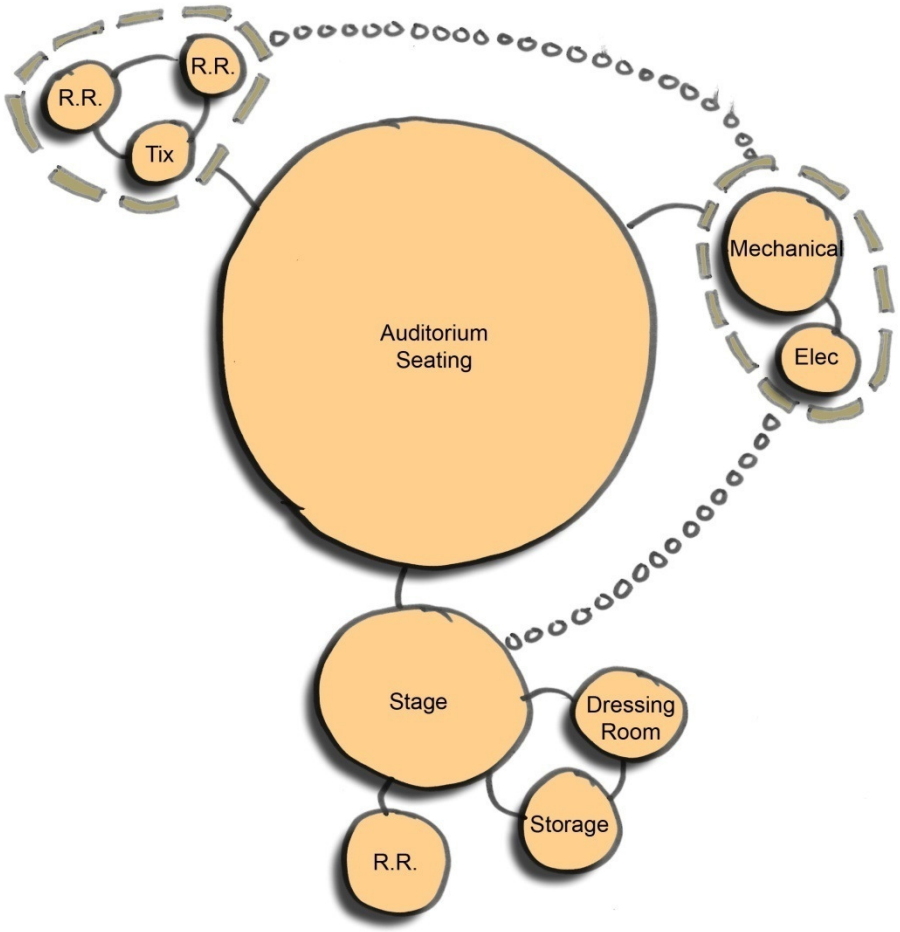
8.2.11 Cafeteria

8,550 square feet



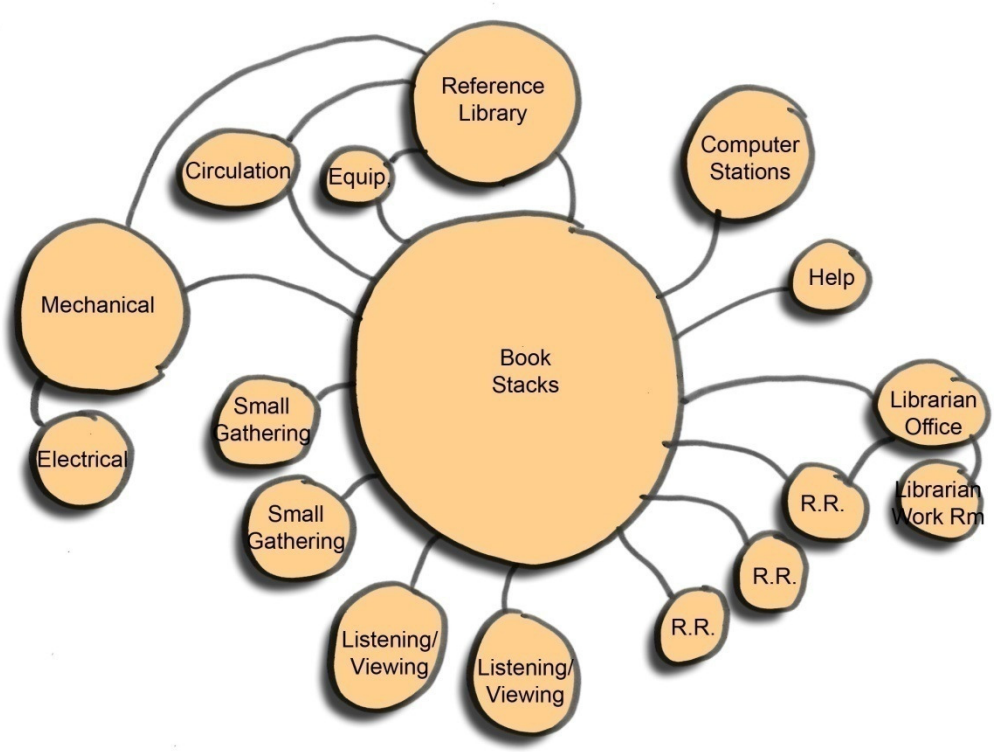
8.2.12 Auditorium

10,580 square feet



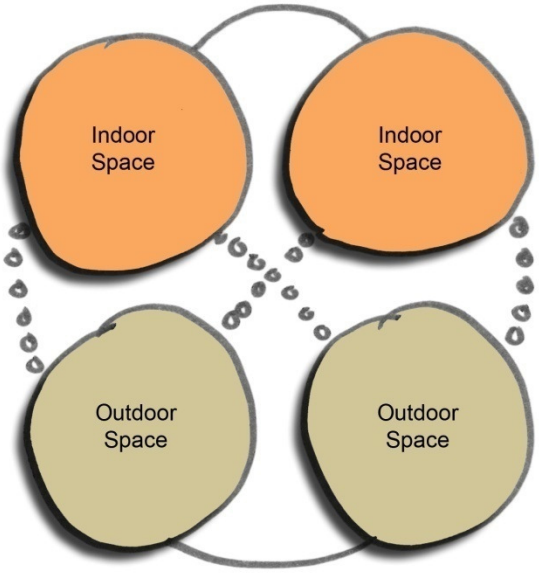
8.2.13 Library

10,280 square feet



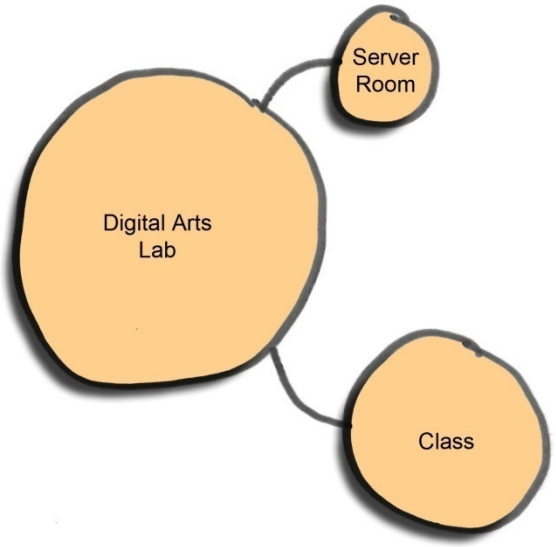
8.2.14 Multi-Purpose Spaces

4,000 square feet



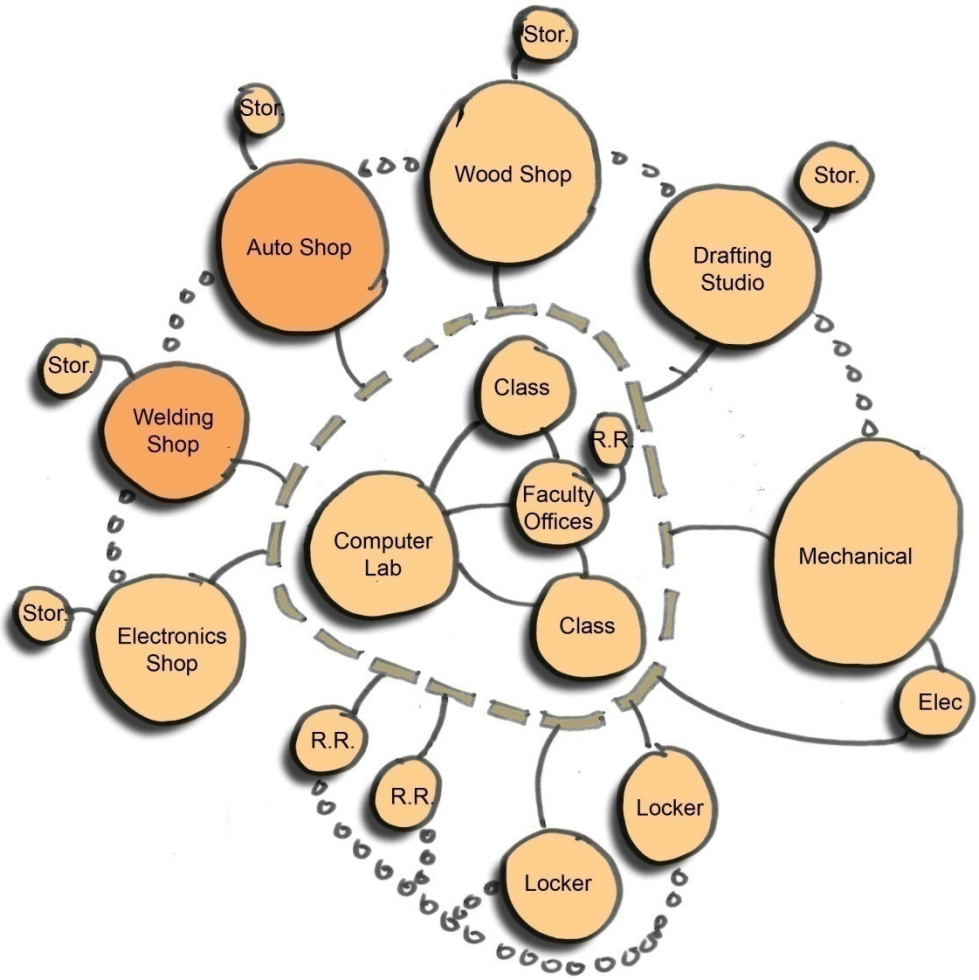
8.2.15 Digital Arts

3,850 square feet



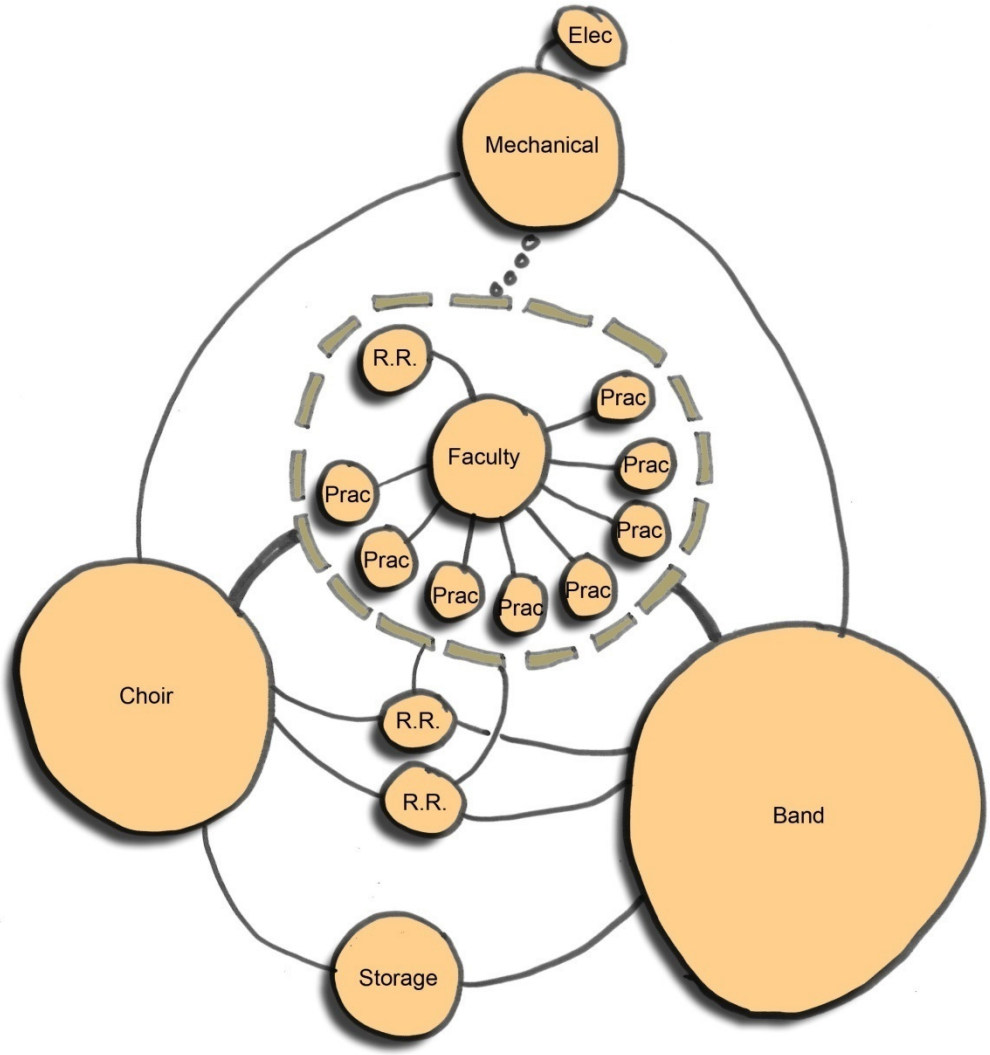
8.2.16 Industrial Arts

12,150 square feet



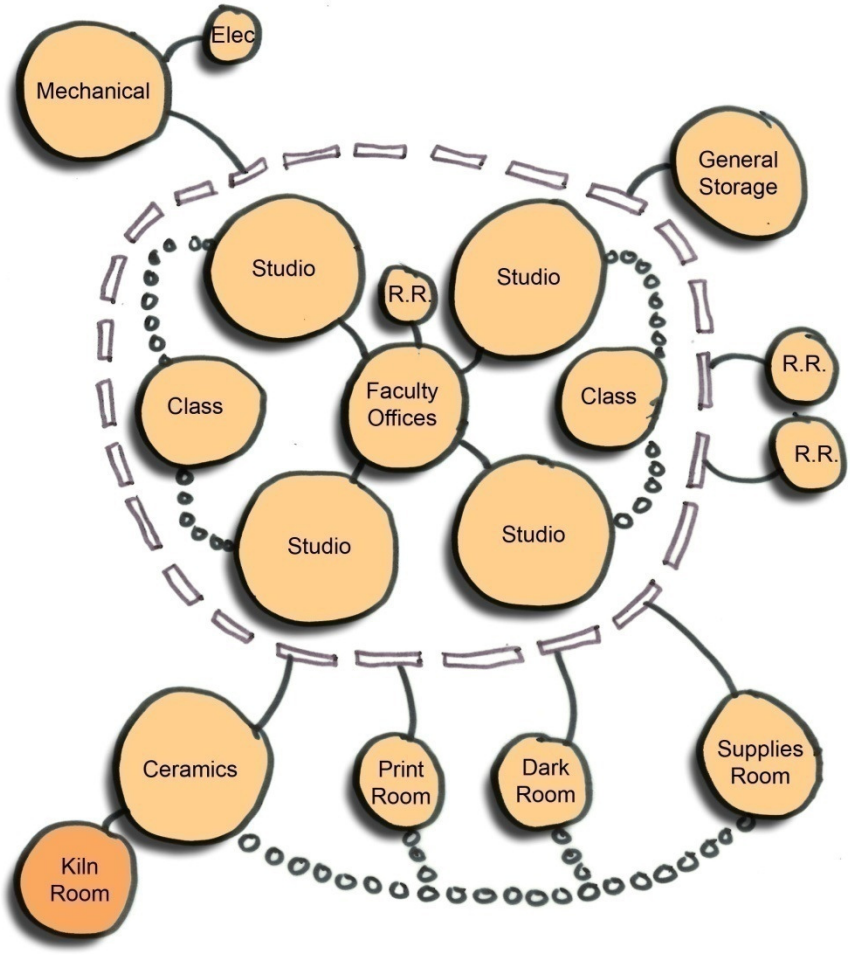
8.2.17 Musical Arts

6,730 square feet



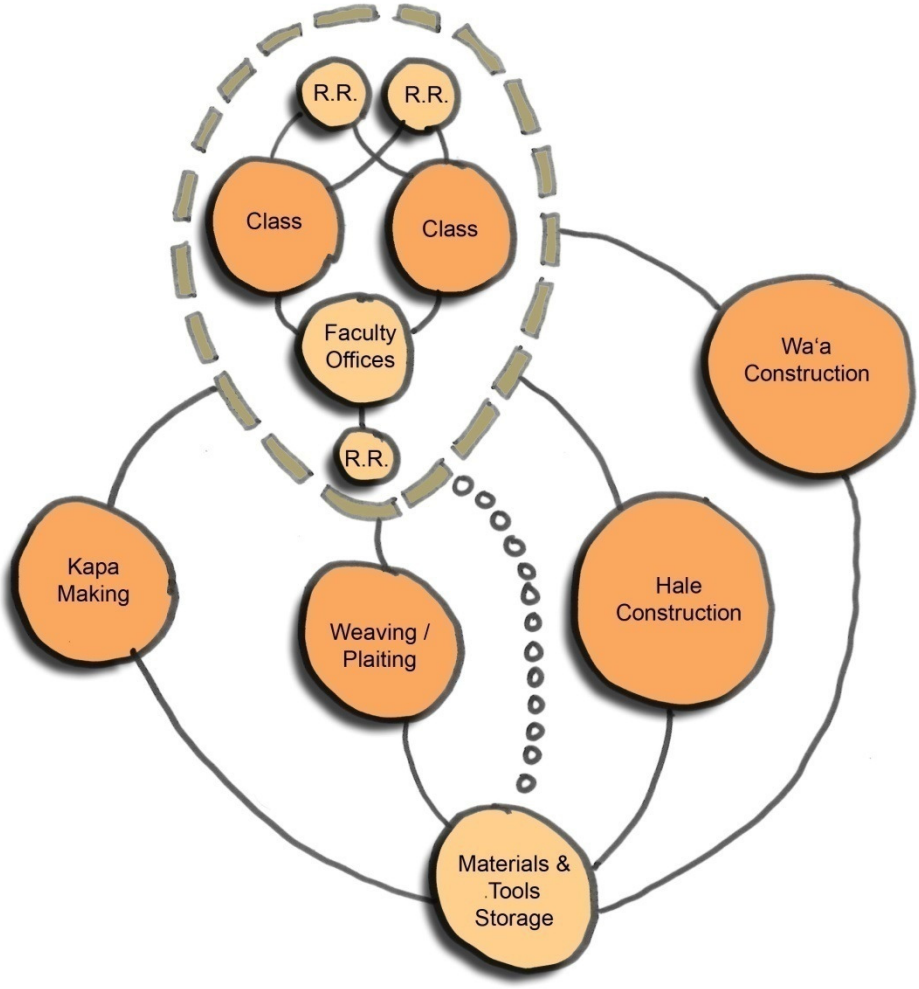
8.2.18 Classical Arts

8,180 square feet



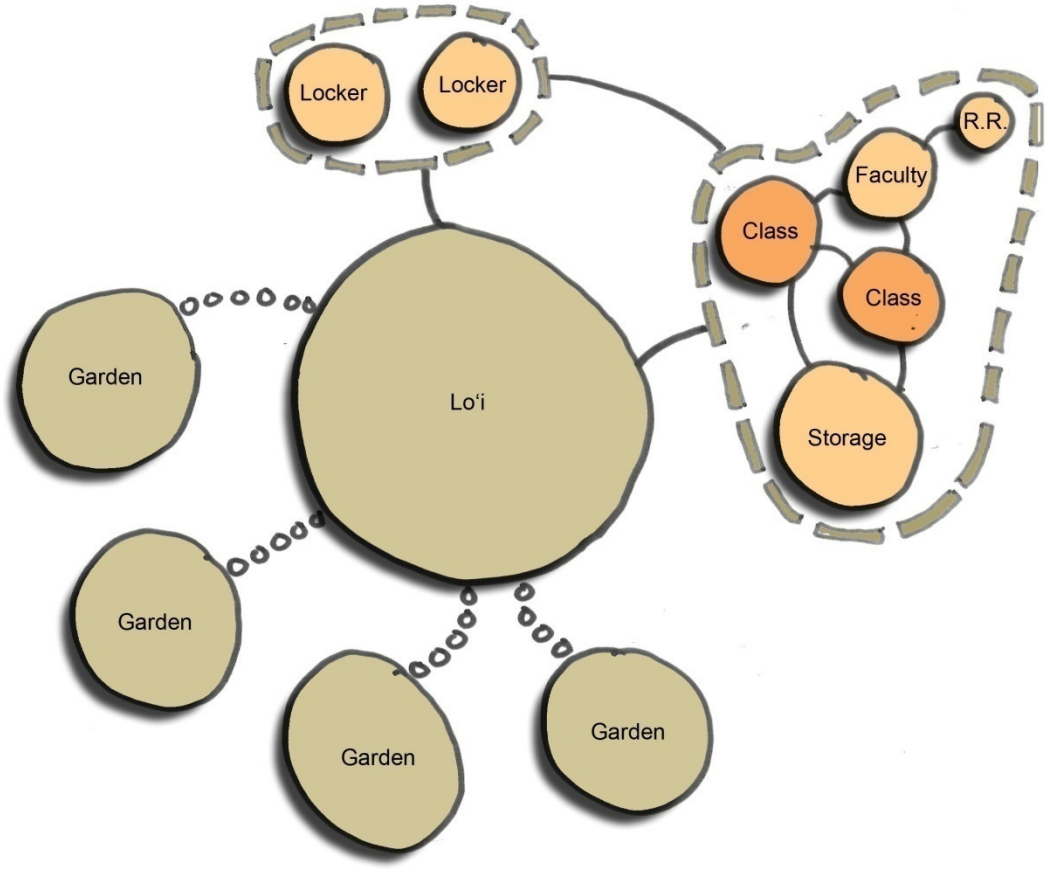
8.2.19 Hawaiian Arts

7,950 square feet



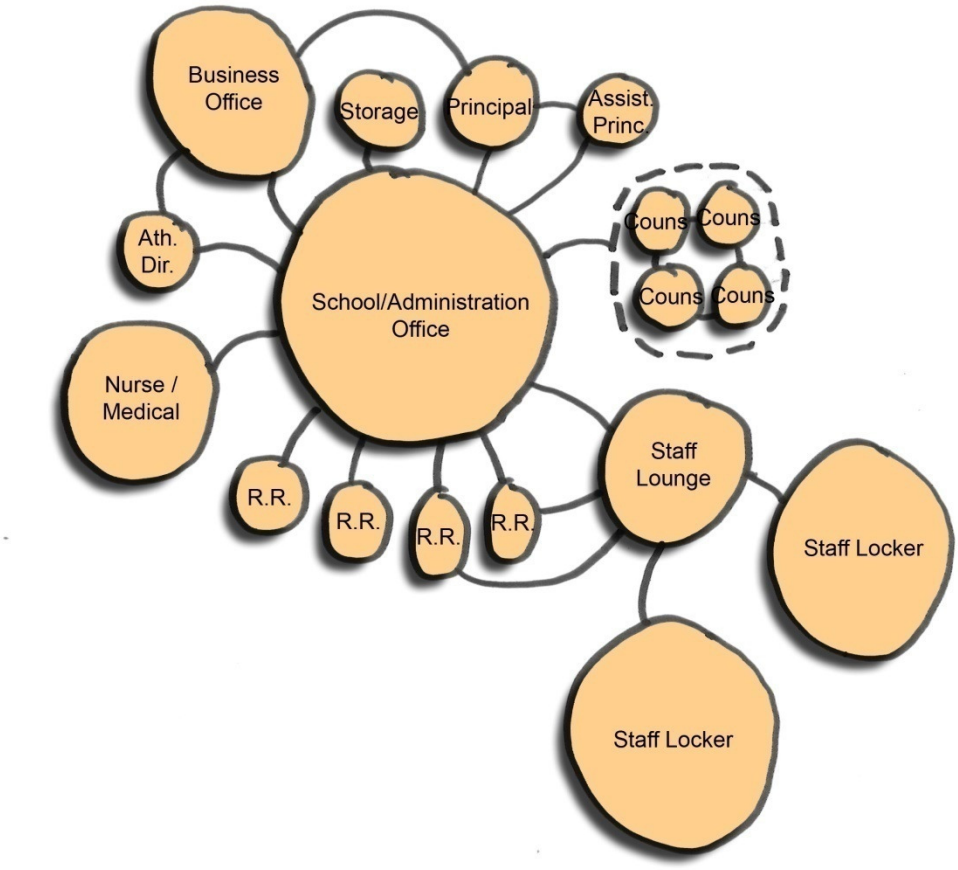
8.2.20 Agricultural Sciences

13,310 square feet



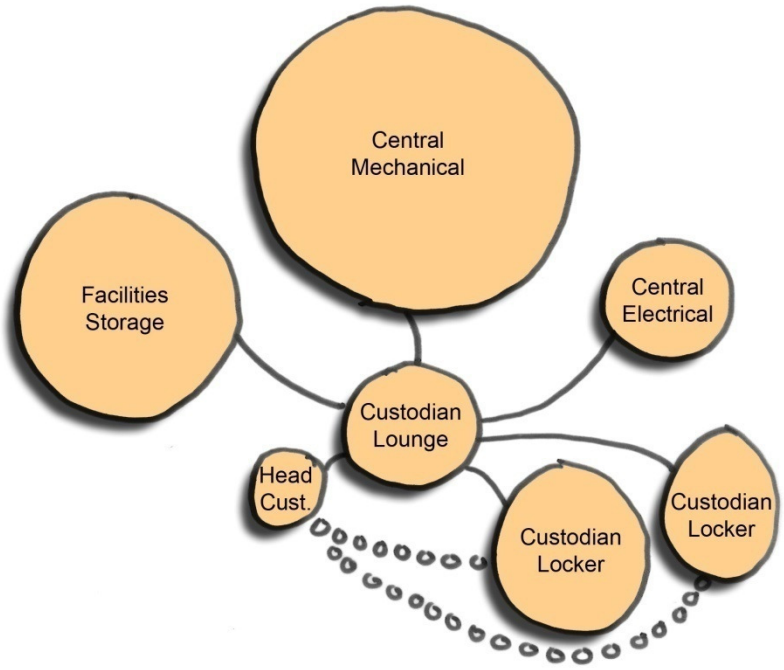
8.2.21 Administration

8,140 square feet



8.2.22 Facilities / Maintenance

6,650 square feet



Chapter 9 | Design Implementation
A High School for Hawai'i

9.1 Introduction to the Design Implementation

The purpose of the design portion of this project is to demonstrate the effectiveness of the Cultural Design Methodology. The methodology is essentially a prescriptive design process that can be used to create architecture which acts as a tool for cultural preservation. This process has been applied to the design of a high school acting to preserve traditional Hawaiian culture. It is not intended to be a "finished" design, rather a concept that could be further developed in the future, and eventually used as a starting point for creating a new high school for the Waiʻanae and Makaha school complexes.

The design has been broken down into three parts. The first of these is "Site Planning," which demonstrates how the Cultural Design Methodology can be applied to the site in order to develop a master plan for site utilization. The second part is "Building Planning," which shows how the major elements of a building can be planned using this process. The third part is called "Architectural Features," which gives examples of the methodology applied to individual elements of the design. Collectively, they serve as a single example of the Cultural Design Methodology applied to aid in the preservation of a traditional culture.

9.2 Site Planning

9.2.1 Ahupuaʻa within the Project Site

As stated in the Cultural Design Methodology, the most important rule when deciding upon the use of the site is to follow the guidance of the traditional culture. In

the research that was done, it was realized that the traditional method of land division in Hawai'i was the *ahupua'a*, which is a strip of land that runs from the mountains to the sea and contains all of the ecological zones in between. The central focus of an *ahupua'a* was typically a river or stream, as fresh water is the source of life. The life in an *ahupua'a,* including the people, hale, and agricultural lands, was therefore typically centered around this body of water.

The project site for this high school is not an entire *ahupua'a*, as the property does not stretch from the mountain peaks to the sea. However the site contains all of the key elements of an ahupua'a, either in true form or metaphorically. The *mauka* boundary of the site is pushed up against the steep mountainside, and in fact contains some areas which are near-vertical *pali* and steep hillside. The *makai* and eastern portions of the site are nearly flat, and represent the plains portion of an *ahupua'a*. Between these two areas are the transition hillsides and midlands often used by farmers for agricultural purposes. Running right through the middle of the property is a stream bed. It is not a stream which has a continuous flow of water, but it comes to life during heavy rainfall and is evidenced by the abundance of plant life surrounding it. The stream does not continue through the *makai* boundary of the site however, as there is a low area in the topography which acts as a marshy collection point for the water. This low area of the site which contains the water is representative of the sea. The result of all of these elements put together is a site which functions very similarly to an *ahupua'a.*

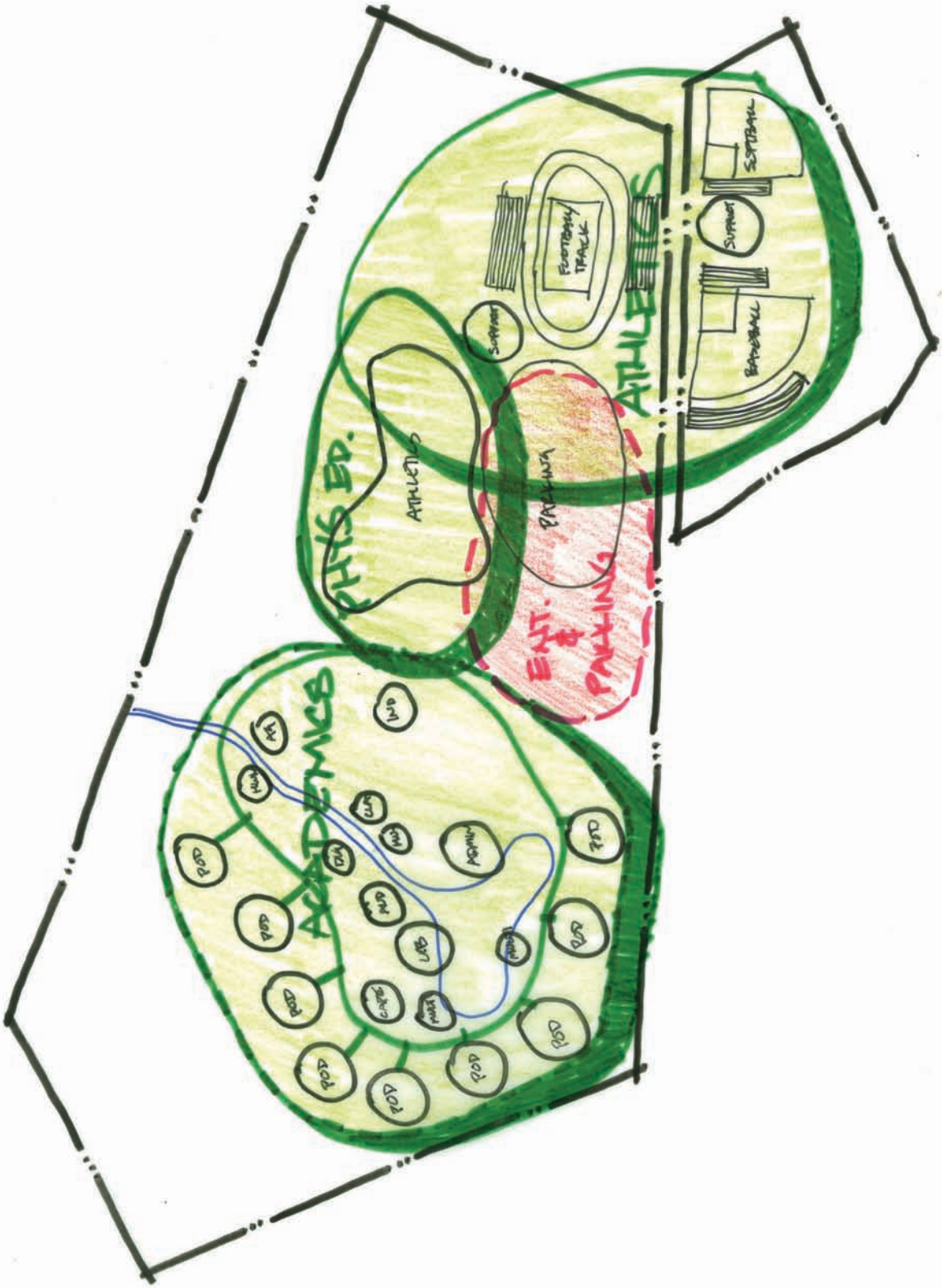
(see diagram on following page)


mountains
plains
midlands
sea
Google
© 2008 Tele Atlas

9.2.2 School Functions Compared to Ahupuaʻa Zones

The features of the different zones of the *ahupuaʻa* have implications on where the functional areas of the high school should be located. Because the athletics department requires large areas of flat land to accommodate the various playing fields, it makes most sense that the athletics be located in the plains area of the *ahupuaʻa*. For this reason, the baseball and softball fields, the football field and track, and all of their associated facilities are located in the southwest area of the property. The agricultural lands which are part of the design make obvious sense to go in the midland agricultural zone near the stream bed. The academic functions of the site should be dispersed around the stream bed, as this is where the life and activity in a traditional *ahupuaʻa* would be centered. This is why all of the classroom pods, shared facilities, and administrative functions have been placed around the stream bed and pond at the bottom.

(see diagram on following page)


PHYS ED.
ATHLETICS
ACADEMICS
ENT. & PARKING
ATHLETICS
PARKING
FOOTBALL TRACK
SOFTBALL
BASEBALL
SOCCER
ADMIN
LAB
CLASS

9.2.3 Focus of This Design Project

For the purpose of demonstrating the methodology, the entire high school campus does not need to be designed. Once the basic functional areas were placed on the site based upon the *ahupua'a* system, it made more sense to choose an area of the campus as a focus for further development. Although athletics and physical education are important parts of a high school, the core elements revolve around academics. For this reason, the area of the site where the academic functions are located has been chosen as the focus of the site design.

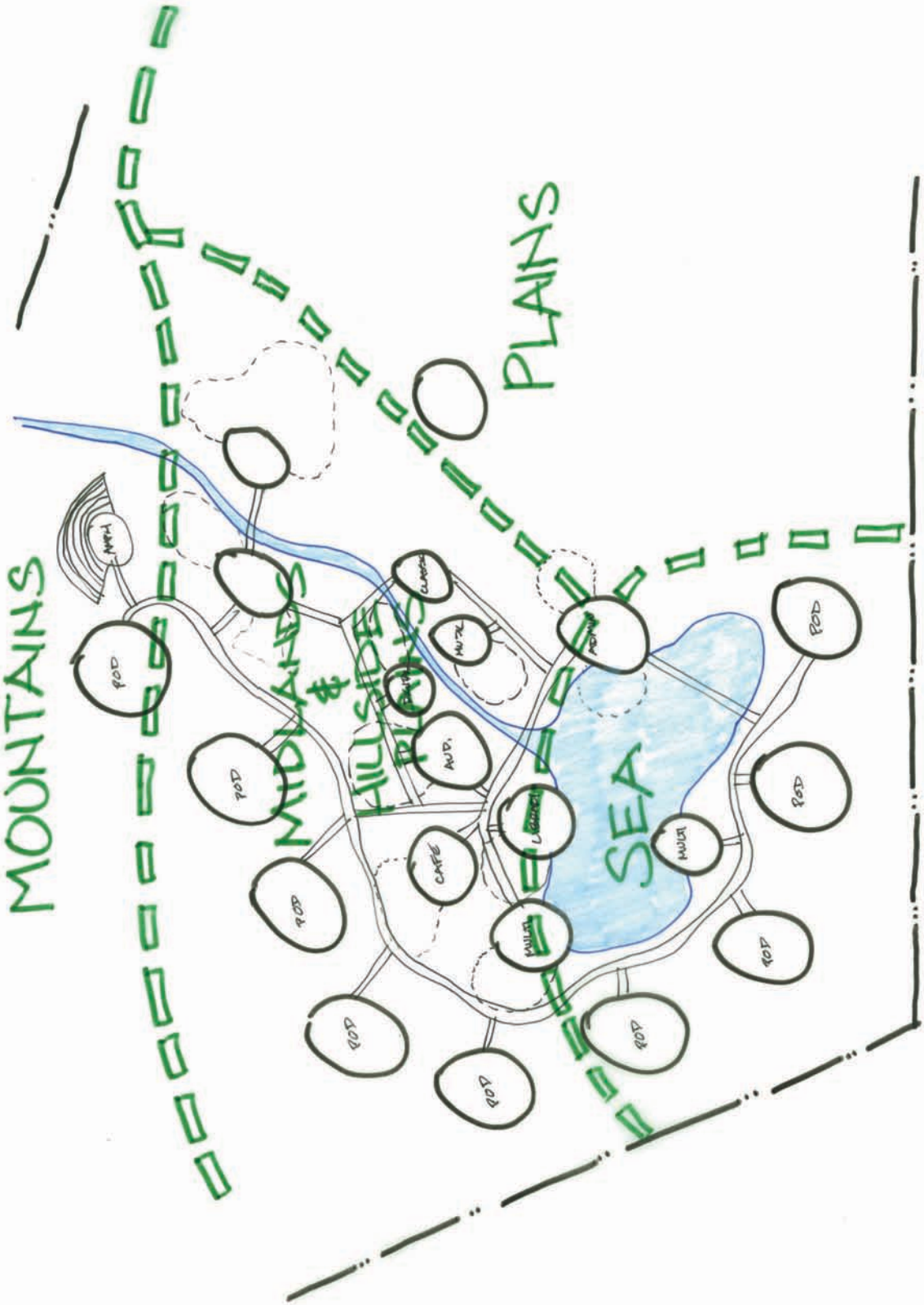
(see diagram on following page)


POND
SIGN

9.2.4 Closer Look at the Ahupuaʻa

By taking a closer look at the *ahupuaʻa*, the relationships of the individual spaces to the *ahupuaʻa* become more apparent. The academic functions are all surrounding the natural water elements of the site, similarly to how *kauhale* in a traditional *ahupuaʻa* would surround the river bed. They are dispersed from the mountain zone all the way to the sea, not clustered in a singular "village" format, which is also how *kauhale* were organized. The major shared facilities of the high school, including the cafeteria, library, gymnasium, administration, etc., are located the closest to the water. They are the most public functions and are shared by all. Surrounding the shared facilities are the classroom pods, which are the more private facilities. This gradation from public to private as one moves away from the stream also echoes how a traditional *ahupuaʻa* would function.

(see diagram on following page)

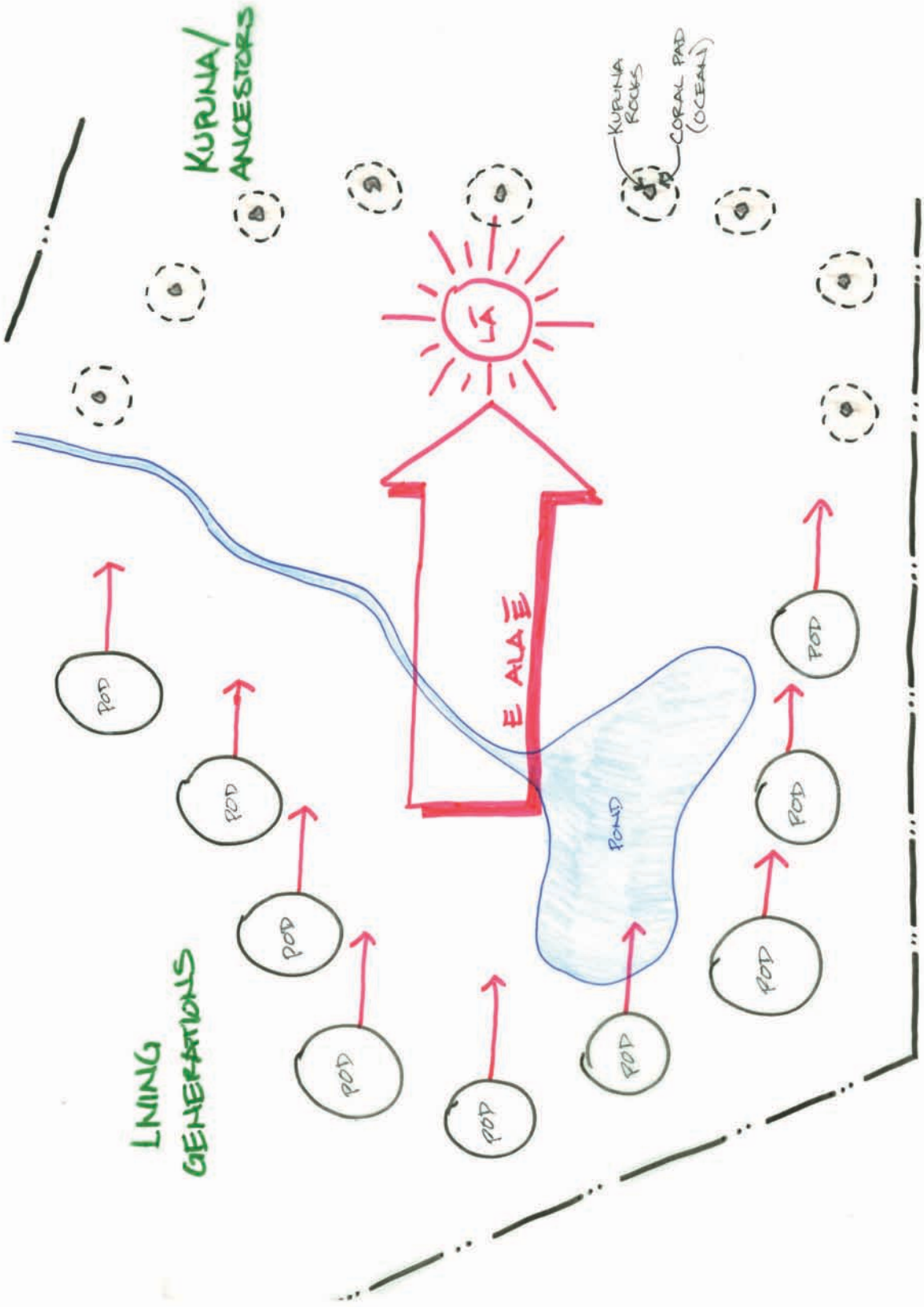

MOUNTAINS
MIDLANDS
HILLSIDE
PLAINS
PLAINS
SEA

9.2.5 Honoring Kupuna Through Pod Organization

The Cultural Design Methodology states that the major cultural themes should also be present in the design of the site. One of these themes discovered during the cultural research was that of family and ancestral ties. This brought back a memory of an access trip to the island of Kaho'olawe. Every morning, the entire group of people who were on the access trip would gather on a *pali* that overlooked the ocean and the rising sun and recite the "*e ala e*" chant. The group would stand in a semi-circle to welcome the rising sun. The other half of the circle was filled by the *kupuna* of past generations out over the ocean. The chant is a tribute to the sun, but also demonstrates the importance of the ancestors by including them as part of this daily ritual.

In the same way, the site should recognize the *kupuna* as part of the daily life of the high school. In order to accomplish this, the classroom pods have been organized in a similar manner as the group that stood on the *pali* on Kaho'olawe every morning while I was there. They are shaped into a semi-circle and oriented directly east towards the rising sun, representative of the generation of today and the future. The *kupuna* are then physically represented by "kupuna stones" on the opposite side of the semi-circle, which are large lava rock boulders laying on a bed of coral stone from the ocean, representative of the ocean itself. By organizing the site in this manner, the school is honoring the *kupuna* every time the sun rises over the horizon.

(see diagram on following page)

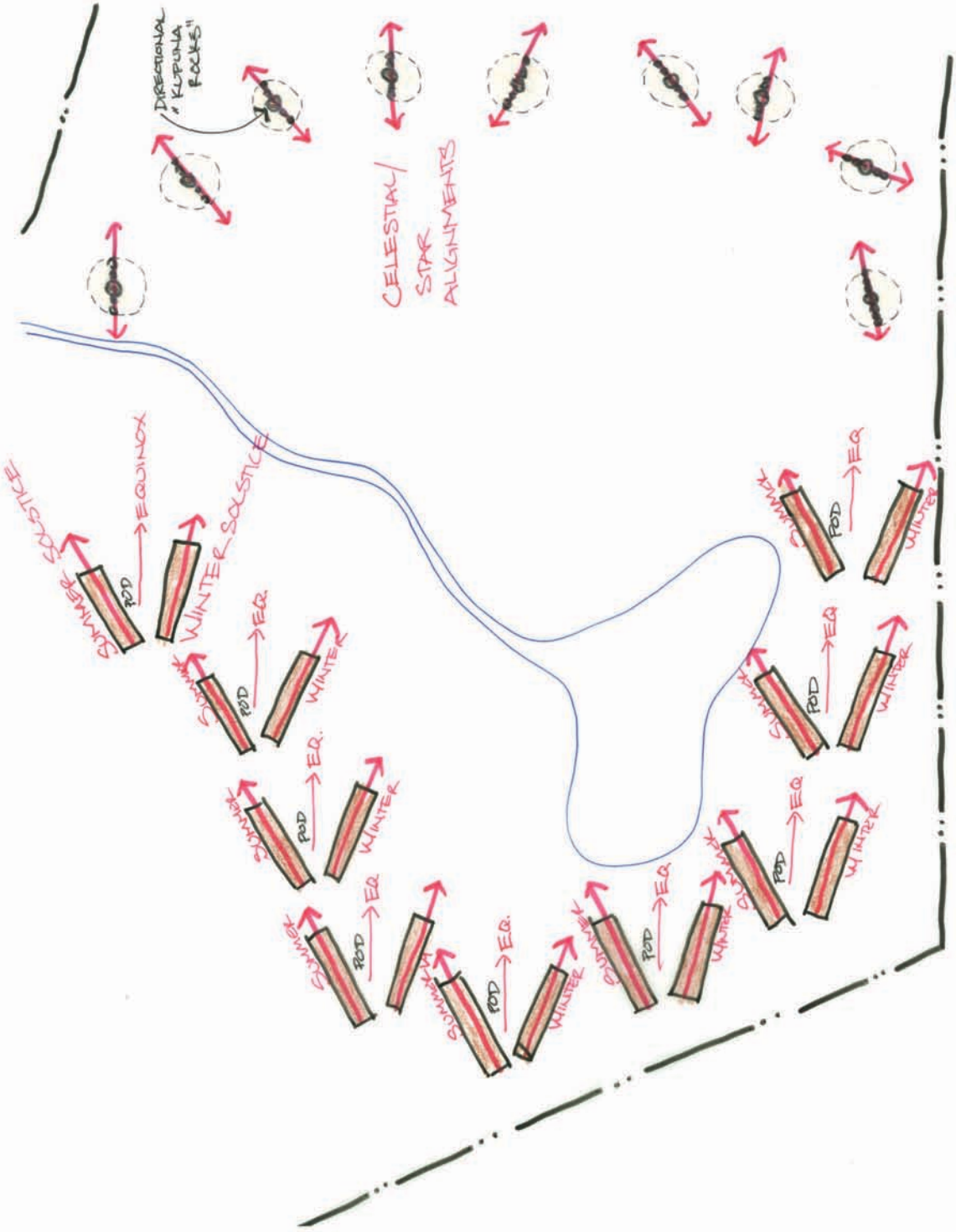

KUPUNA/
ANCESTORS
KUPUNA
ROCKS
CORAL PAD
(OCEAN)
LA
E ALA E
POND
POD
LNING
GENERATIONS

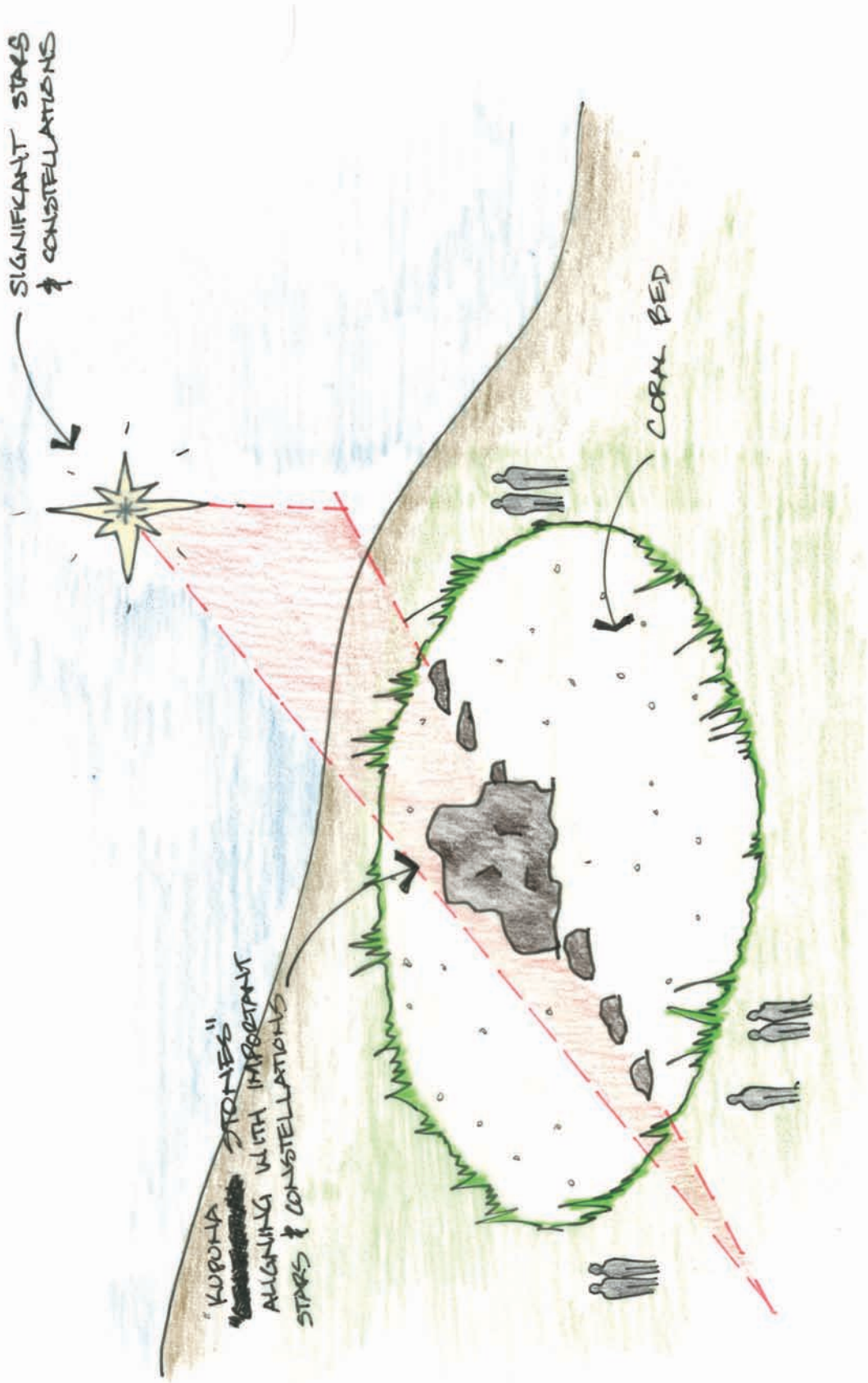
9.2.6 Astronomical Alignments

Another major cultural theme of the traditional Hawaiian culture is the importance of astronomy. Because astronomy affected the lives of ordinary people in so many different ways, it was often reflected in the traditional buildings through solar alignments. The design of the classroom pods will also reflect this reverence for celestial knowledge. Each classroom pod has two wings which come together in a "V" shape. One of the wings is in direct alignment with the summer solstice, and the other is aligned with the winter solstice. The implied alignment is the space directly between the two solstices, which is the equinox point.

While the classroom pods recognize the movements of the sun, the "kupuna stones" pay tribute to the stars. In addition to the large lava rock boulder on each "kupuna stone" coral bed, there are also smaller lava stones arranged in a line, with the boulder at the center. This line is directly in line with specific star locations at specific times of the year. Each stone has its own unique alignment which points to a different star that is significant to traditional Hawaiian culture.

(see diagrams on following two pages)

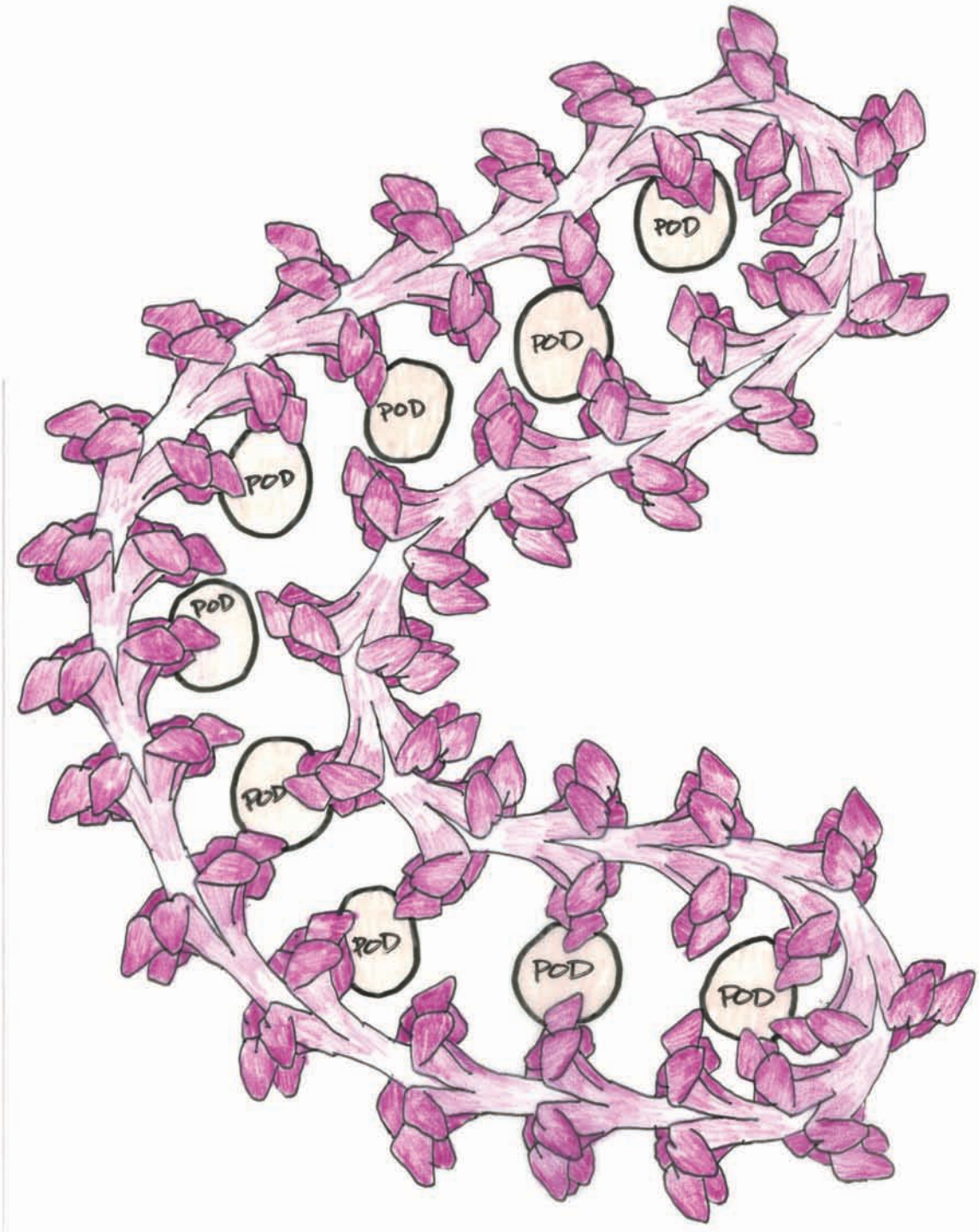

DIRECTIONAL "KUPUNA ROCKS"
CELESTIAL/ STAR ALIGNMENTS
SUMMER SOLSTICE
EQUINOX
WINTER SOLSTICE
POD
EQ.
SUMMER
WINTER


SIGNIFICANT STARS & CONSTELLATIONS
CORK BED
"KUBOTA" STONES ALIGNING WITH IMPORTANT STARS & CONSTELLATIONS

9.2.7 Lei as a Uniting Element

Although the classroom pods are distinctly different elements on the site, they are all serving the same basic purpose. Rather than having the pods be divisive elements between the students, it would be more appropriate to tie them all together as a symbol of unity and equality. This has been accomplished by using the traditional craft of lei-making. A lei is a symbol of *aloha*, and placing a lei around all of the classroom pods is a way of physically creating a sense of unity amongst the students on campus. This lei will be accomplished by ringing the classroom pods with continuous rows of flowering plants and hedges.

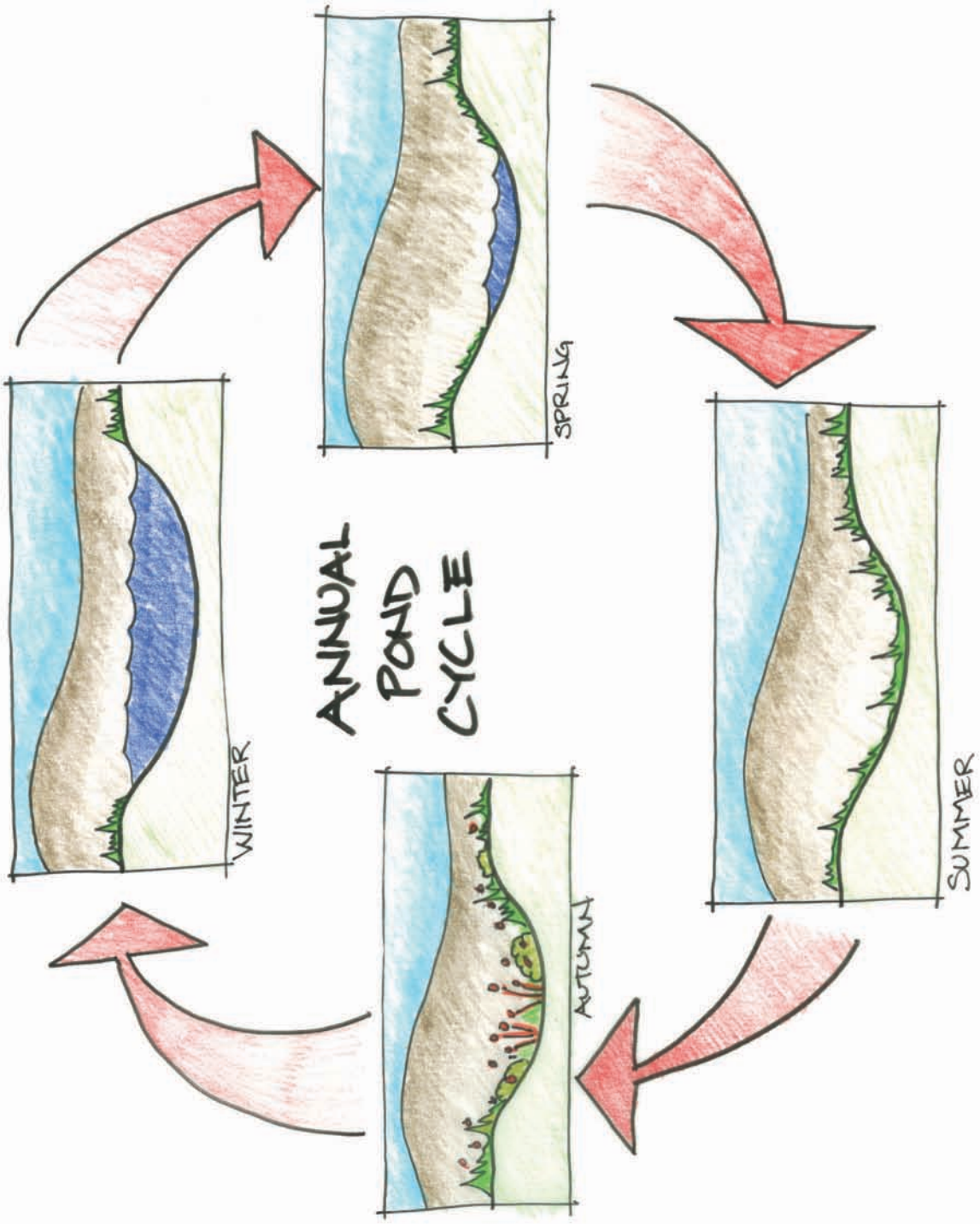
(see diagram on following page)


POD
POD
POD
POD
POD
POD
POD
POD
POD

9.2.8 Life-Cycle Pond

In addition to the classroom pods and "kupuna stones," there are many more features of the site which were developed as a result of the Cultural Design Methodology. One of these elements is the "Life-Cycle Pond." This pond is to be representative of the "life-cycle events" theme of the traditional Hawaiian culture. The pond is at the bottom of the stream that runs through the site and serves as the collection point for the water run-off. It is a naturally occurring depression in the landscape, but it will be further developed with plantings which enhance the life-cycle theme. During the winter months, there is much more rain in Makaha Valley than during the summer, and water collects in the pond. During the spring months, the water slowly disappears making the pond much smaller in size and depth. In the summer, when the rainfall is much more sparse, plant life begins to form in the depression. Then by fall, it is fully grown with various types of plants and flowers, surviving off of the nutrients deposited in the soil by the previous year's stream flow. Then winter comes, and it floods again. This is an annual cycle with creates a physical representation of the circle of life, and thus demonstrates the major cultural theme of "life-cycle events."

(see diagram on following page)


ANNUAL
POND
CYCLE
SPRING
SUMMER
AUTUMN
WINTER

9.2.9 Traditional Functional Spaces

Another way of infusing the traditional culture into the design of the site is by incorporating spaces for traditional functions. One example of this is on the site is a ceremonial space. This space is a stone platform that extends out into the "life cycle pond." This platform can be used for ceremonies or events such as hula. Another space with a traditional function is the protocol space next to the admin building. This space is dedicated to cultural protocol activities such as prayers and chants. By incorporating these spaces which allow for traditional functions, it is a way of directly preserving these aspects of the culture.

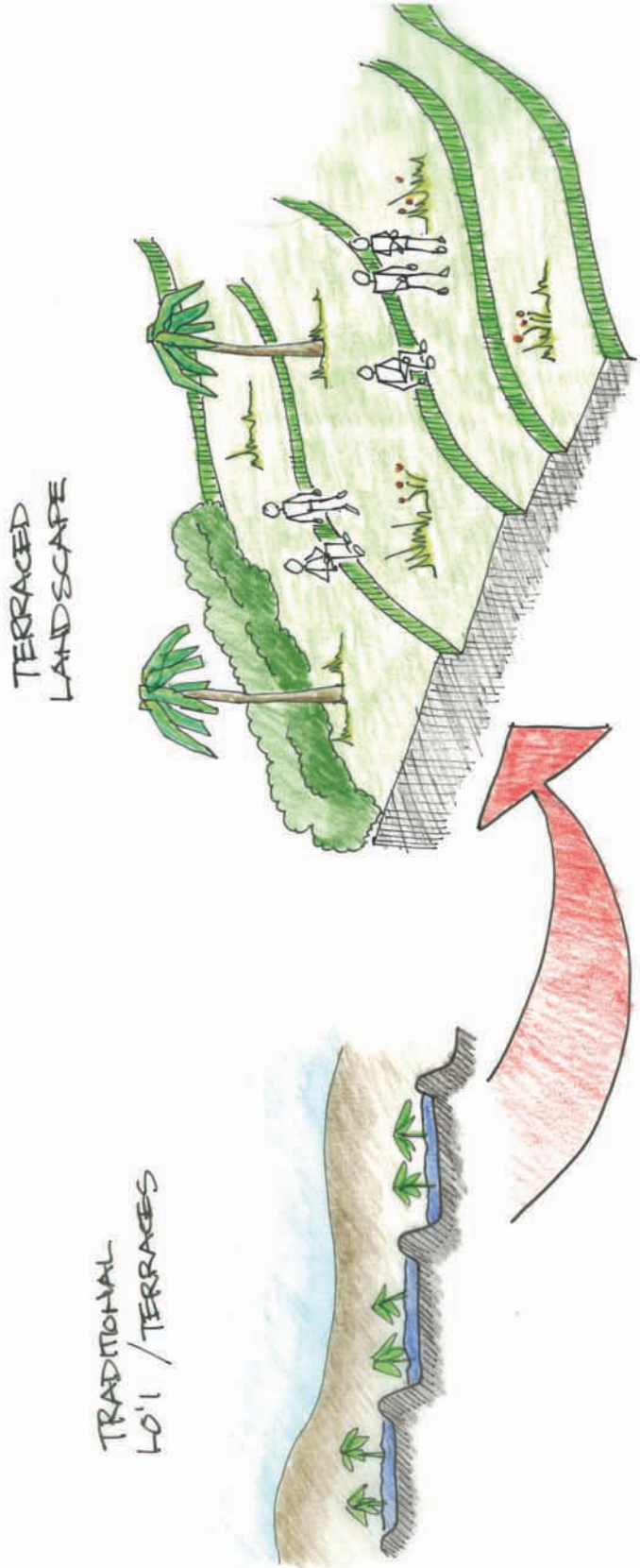
(see diagram on following page)


STONE PLATFORM
SEASONAL POND

9.2.10 Site Feature Contemporary Interpretation

Terraces were a big part of the built environment in traditional Hawaiian culture. The cultivation of wetland taro relied heavily upon these terraces, and thus the livelihood of the Hawaiian people relied heavily upon them as well. Therefore, a terraced landscape, especially in the area surrounding a stream or river, has significant cultural meaning. For this reason, many terraced areas have been worked into the site plan in the area surrounding the stream. These terraces are not serving the same function as a traditional terrace, as they are not being used for agricultural purposes. The appearance, however, is one that evokes emotion as it is a reflection of one of the elements of the traditional culture that is very unique to Hawai'i. Incorporating the terraces in to the site design in this way is an example of interpreting a specific feature of the site into a more contemporary form.

(see diagram on following page)


TERRACED
LANDSCAPE
TRADITIONAL
LO'I / TERRACES

9.2.11 Site Planning Conclusion

There are many ways in which the Cultural Design Methodology has been applied in the design of the site for this high school. The traditional method of using a site was applied in the creation of a master plan for the entire facility. The major cultural themes were then used to determine how the spaces will interact with each other. From there, other elements such as traditional function, crafts and arts, and unique elements of the culture, were used to begin planning the individual spaces. The solutions are unique to this building type, this culture, and this particular location, but the methods and design process can be applied anywhere.

9.3 Building Planning

9.3.1 Designing the Classroom Pods

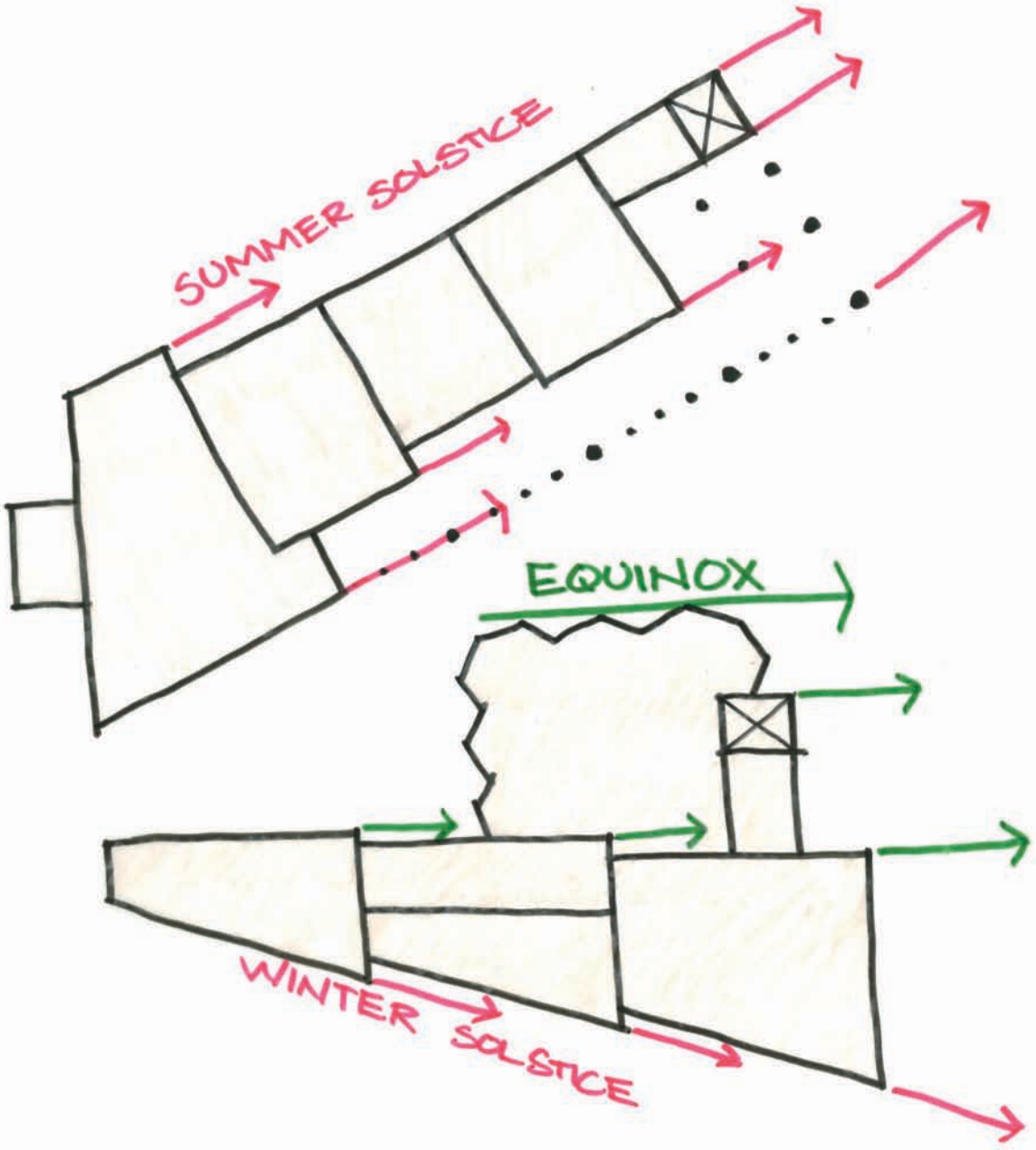
In order to demonstrate the effectiveness of the Cultural Design Methodology at the building planning level, one of the buildings had to be chosen for further development. The classroom pods are the most academically significant spaces to the high school as this is where the majority of the learning takes place. Because each pod more or less functions as a miniature school within the school, it is also the place where much of the social and cultural learning takes place. This is why the classroom pod was chosen for further development.

9.3.2 Building Astronomy

In traditional Hawaiian culture, buildings were often oriented towards the movements of the sun. This was done as a tribute to the awesome power of the sun, and also for the more functional purpose of creating a built-in calendar. By tracking the sun's movements and aligning the walls of a building with the solstices and equinoxes, other activities in life which were planned for certain times of year could be more effectively planned simply by watching how the sun aligned with building.

As mentioned in the Site Planning section, the classroom pods are oriented towards the movements of the sun in the same manner as many traditional *hale*. There are two different wings of each classroom pod. One wing points towards the summer solstice, and the other towards the winter solstice. Many of the individual elements within each of these wings are also in direct alignment with the respective solstice. Then there are building elements between the two wings which are aligned with the equinox point. In this manner, each of the classroom pods, although slightly different, act as solar calendar through the positioning of their walls.

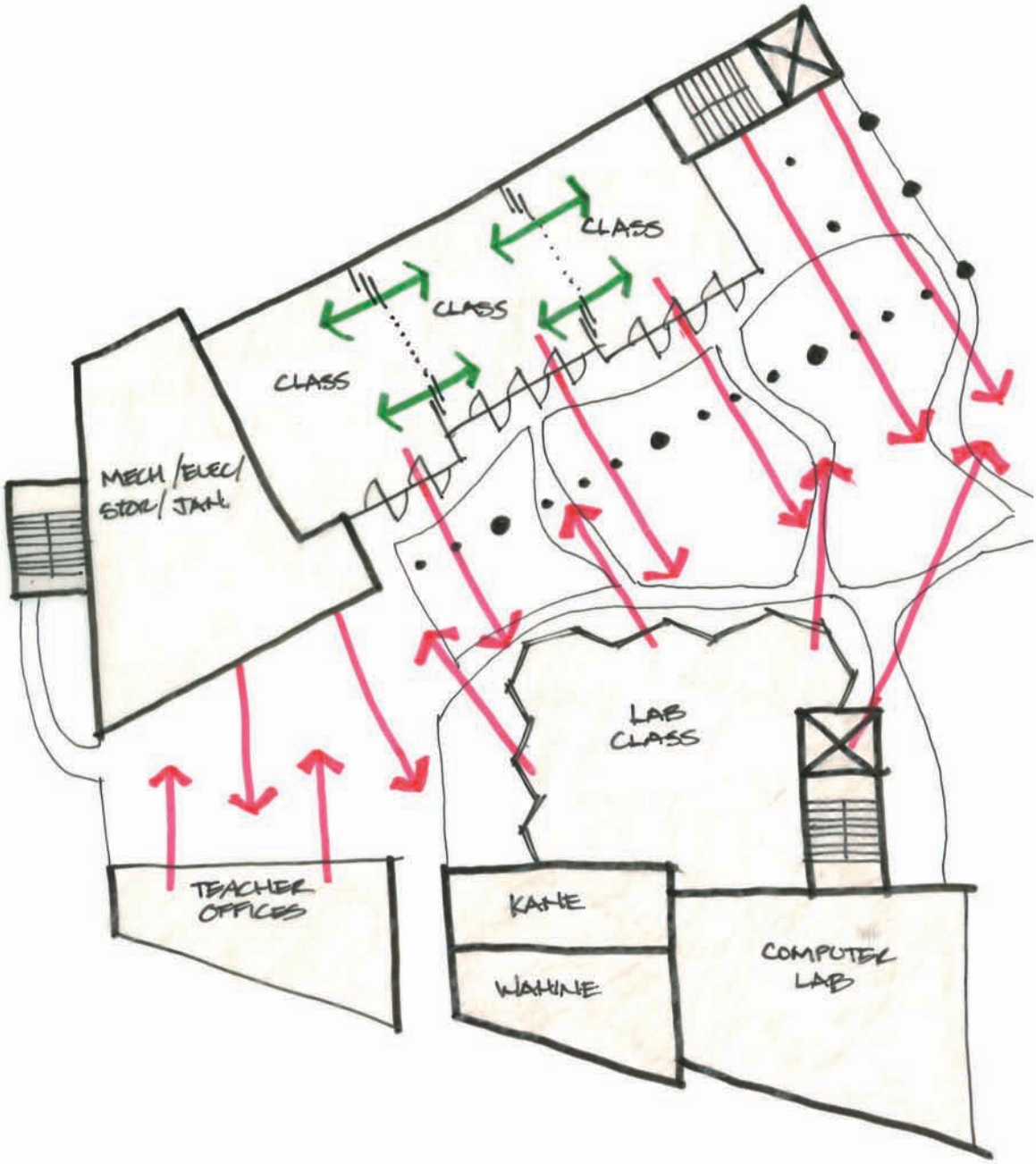
(see diagram on following page)


SUMMER SOLSTICE
EQUINOX
WINTER SOLSTICE

9.3.3 Learning Through Interaction

In the traditional Hawaiian education system, learning was accomplished more through interaction and physical activity than classroom-style learning. To meet the standards of the modern-day educational facility, classroom spaces are still quite important, but the interactional style of learning has also been incorporated. This is done in a very literal way in the Hawaiian arts building on campus, but is also accomplished in the classroom pod buildings. The courtyard space between the two wings has intentionally been created as a place for criss-crossing and forcing interaction between students and teachers. Also, the individual classrooms also expand to create larger group-style learning places. With the inclusion of the outdoor locker space and social gathering area, the building acts as a tool for enforcing this traditional style of learning.

(see diagram on following page)


CLASS
CLASS
CLASS
MECH /ELEC/
STOR/ JAN.
LAB
CLASS
TEACHER
OFFICES
KAHE
WAHINE
COMPUTER
LAB

9.3.4 Resulting Floor Plan

The ground floor plan works to accomplish this forced interaction in several ways. First of all, there are the narrow winding paths that stretch between the two wings of the buildings. By making them narrow, the building users are more likely to pay attention to those they encounter along the way. Also, the meandering pathways force the users to slow down and pay attention to their surroundings. There is also the large gathering social gathering space where the two wings meet. This is a space for more casual interaction and social learning.

(see diagram on following page)

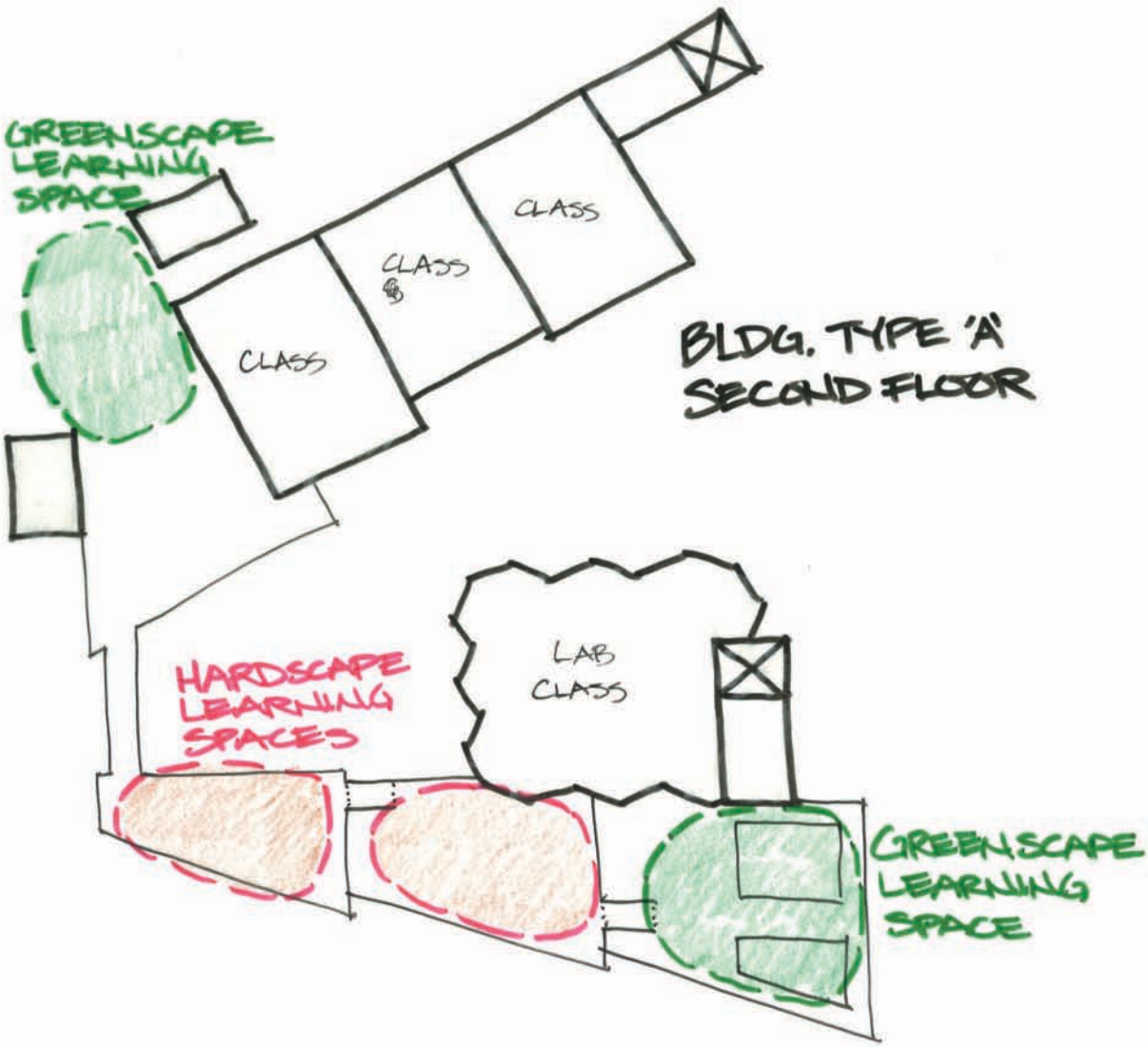

OUTDOOR CLASS
CLASS
CLASS
CLASS
MECH /ELEC/ STOR/ JAN.
LAB CLASS
TEACHER OFFICES
KANE
WAHINE
COMPUTER LAB

9.3.5 Preserving Traditional Ideals

Because traditional Hawaiian learning was typically accomplished by physically doing, the learning usually took place in an outdoor environment. Although much of today's education system relies upon learning from books, it is still important for children of Hawaii to develop a relationship with the outdoor environment as part of their learning process. By learning in outdoor environments, students will learn more about the workings of nature and develop a deeper respect for its awesome power and beauty. This ideal is very important to the traditional Hawaiian culture, and is therefore something that should be preserved by this building. This is why there are many different outdoor places of learning that have been designed into each classroom pod. The diagrams on the following two pages show how these outdoor learning spaces have been incorporated in the design of both the first and second floor of the classroom pods.

(see diagrams on following two pages)

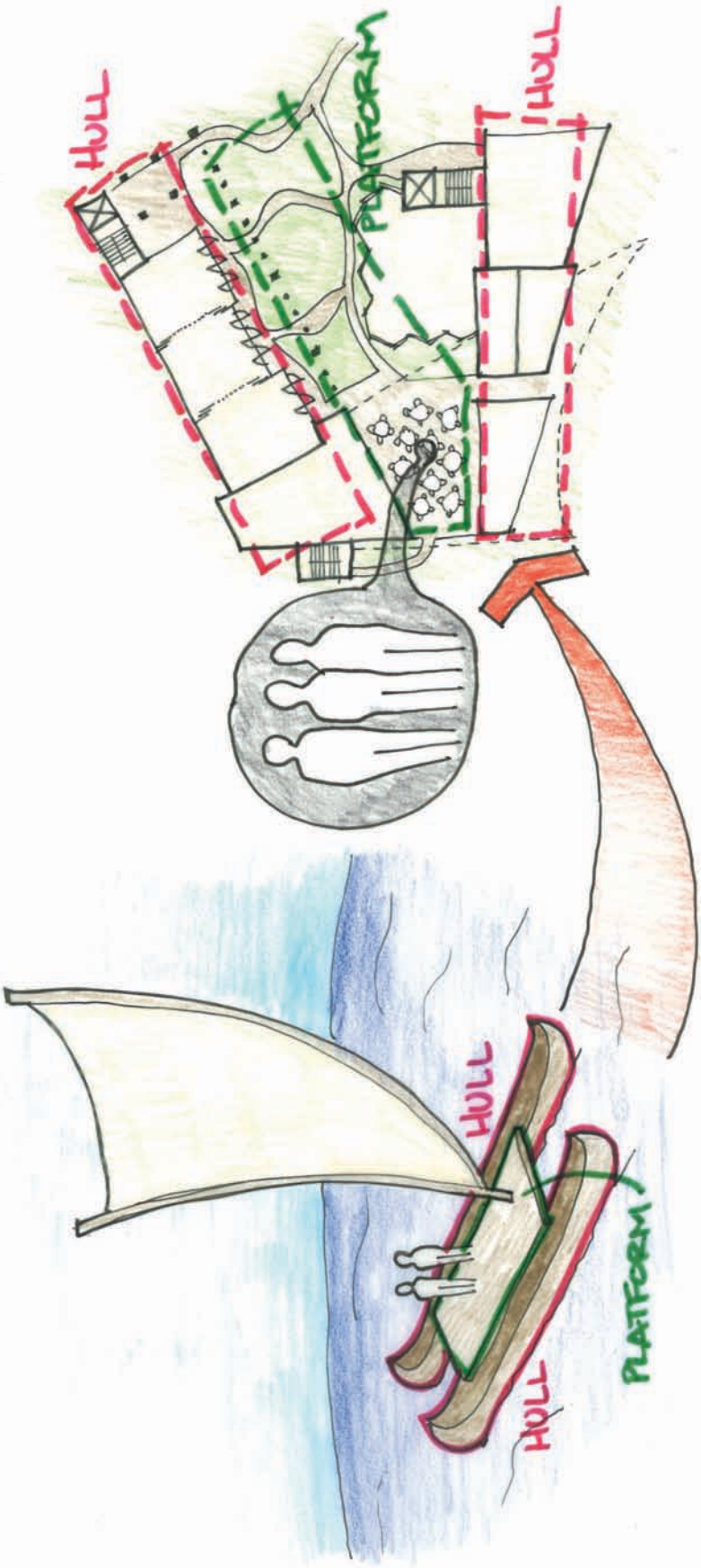

BLDG. TYPE 'A'
GROUND FLOOR
CLASS
CLASS
CLASS
MECH/ELEC/
STOR/ JAN
HARDSCAPE
LEARNING
SPACE
GREENSCAPE
LEARNING
SPACES
LAB
CLASS
HARDSCAPE
LEARNING
SPACE
TEACHER
OFFICES
KANE
WAHINE
COMPUTER
LAB


GREENSCAPE LEARNING SPACE
CLASS
CLASS
CLASS
BLDG. TYPE 'A' SECOND FLOOR
LAB CLASS
HARDSCAPE LEARNING SPACES
GREENSCAPE LEARNING SPACE

9.3.6 Organization Inspired from Traditional Craft

As discussed in the cultural research portion of this project, the Hawaiian double-hulled canoe is one of the most recognizable of traditional Hawaiian crafts. Sailing has a rich history throughout Polynesia, but the traditional Hawaiian canoe does not have an identical counterpart anywhere else in the Pacific. It is because of this uniqueness that the classroom pods have been metaphorically modeled after this form the traditional craft. In a traditional double-hulled canoe, there are two separate hulls as the name implies. There is then a platform which connects the two hulls which serves the function of storage goods or providing space for people during a voyage. The building, similar to the canoe, has two hulls separated by a platform. The hulls are the two distinct wings of the building, and the symbolic platform is the social gathering area in between.

(see diagram on following page)

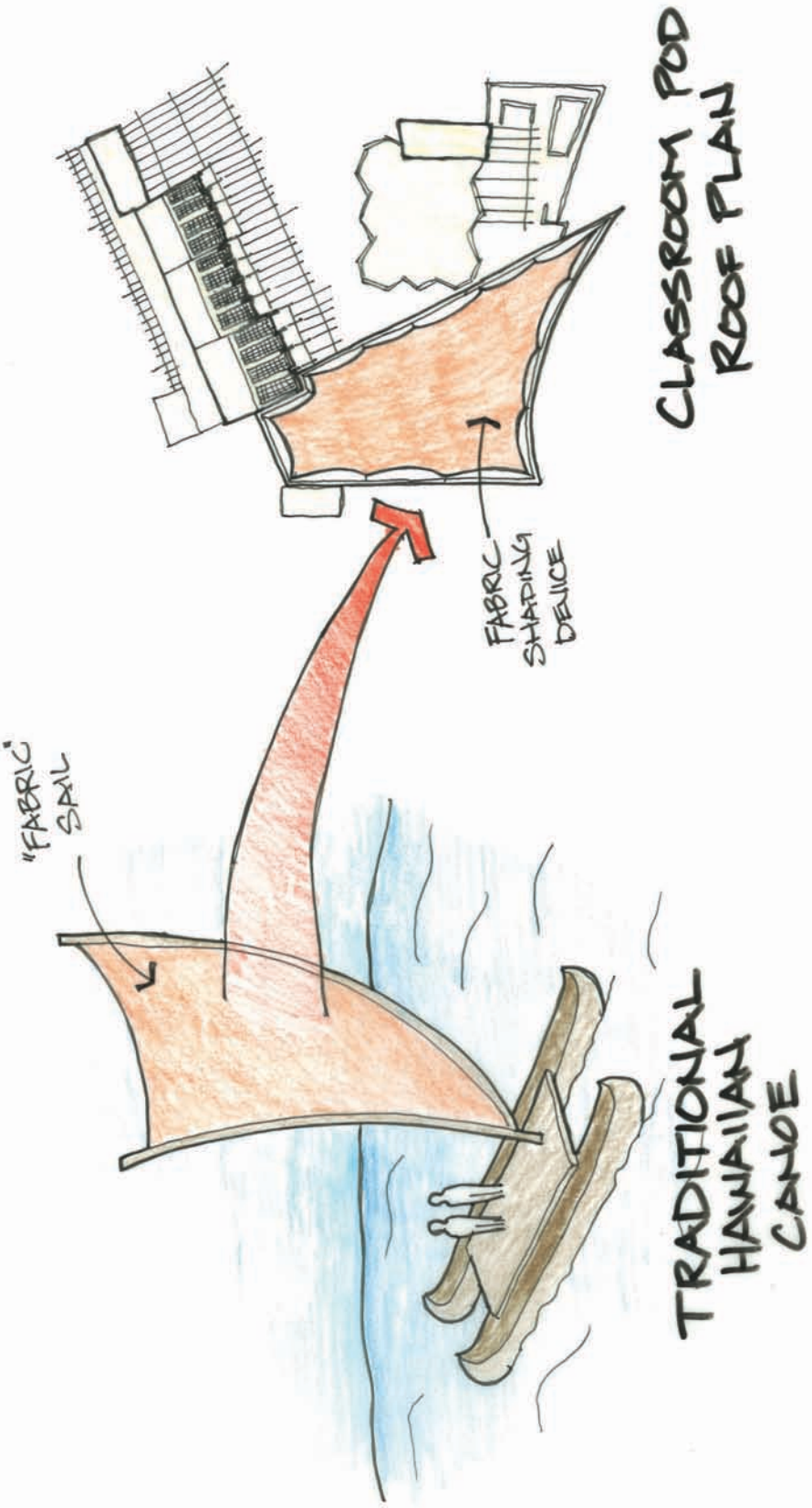

HULL
PLATFORM
HULL
HULL
HULL
PLATFORM

9.3.7 Physical Form Inspired by Traditional Craft

Another unique element of the traditional Hawaiian canoe is the sail. The shape of the traditional sail is similar to an inverted triangle. Again, similar shaped sails are found elsewhere in the Pacific Islands, but none carry this same shape. For this reason, the sun shade which spans over the top of the locker area, social gathering area, and part of the outdoor learning area on the second floor roof deck, has been shaped in a manner that is reminiscent of this unique sail shape. The sail would traditionally be made of a fabric-like material, either woven or of *kapa*. The sun shade on the classroom pod is also made from fabric, stretched over an aluminum frame. The result is a completely functional shading device which is visually representative of traditional craft unique to Hawaii.

These elements which are representative of a Hawaiian canoe also have a deeper meaning. The double-hull, platform, and sail combine to create a metaphorical sailing vessel. This vessel is carrying the students towards their futures, and being navigated by their *kupuna* and the stars above through the "*kupuna* stones" and astronomical alignments which they face. In traditional Hawaiian culture, children learn from their *kupuna*, and this sailing vessel allows the children of today to learn in the same way.

(see diagram on following page)

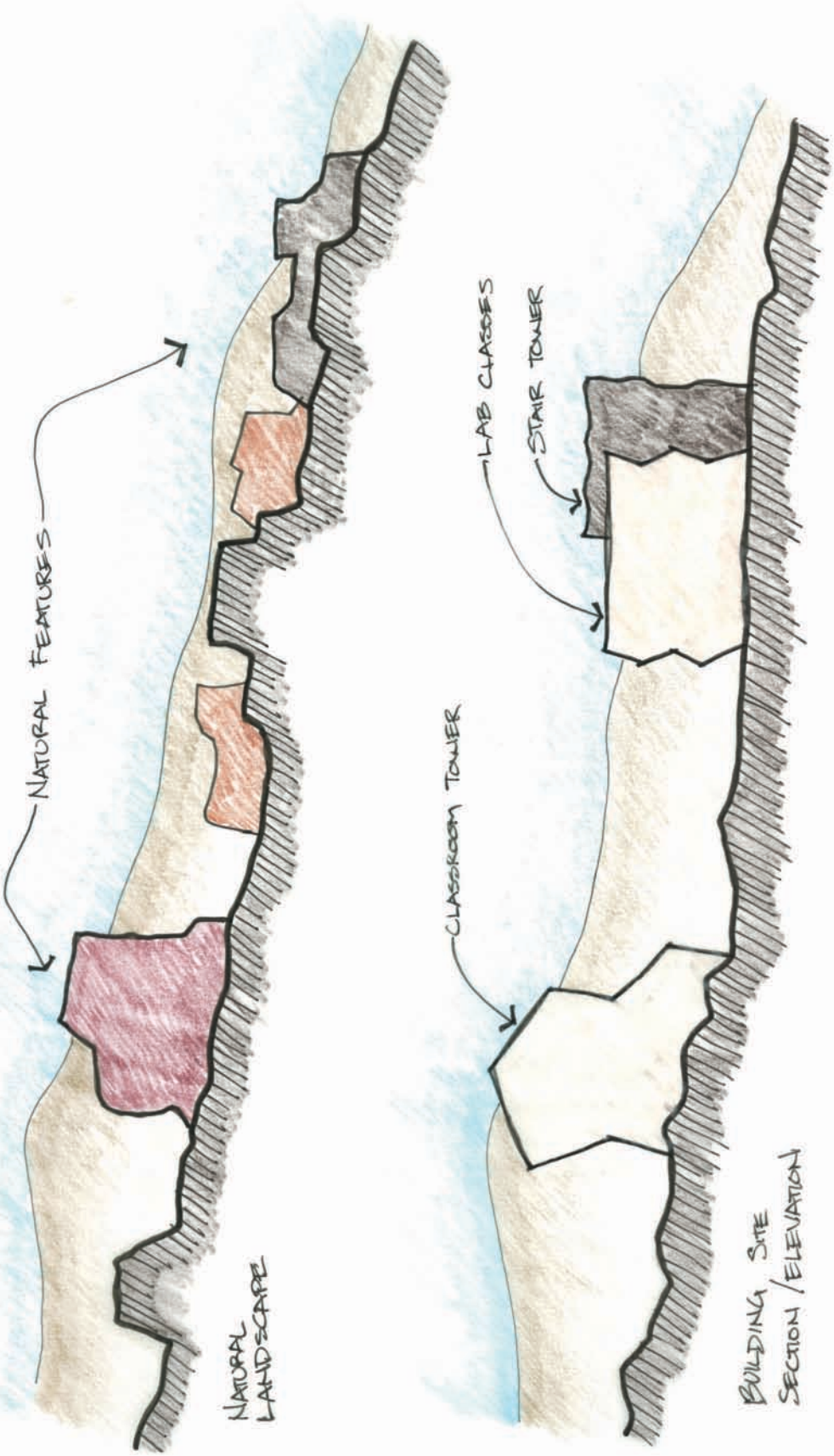

CLASSROOM POD
ROOF PLAN
FABRIC SHADING DEVICE
"FABRIC" SAIL
TRADITIONAL HAWAIIAN CANOE

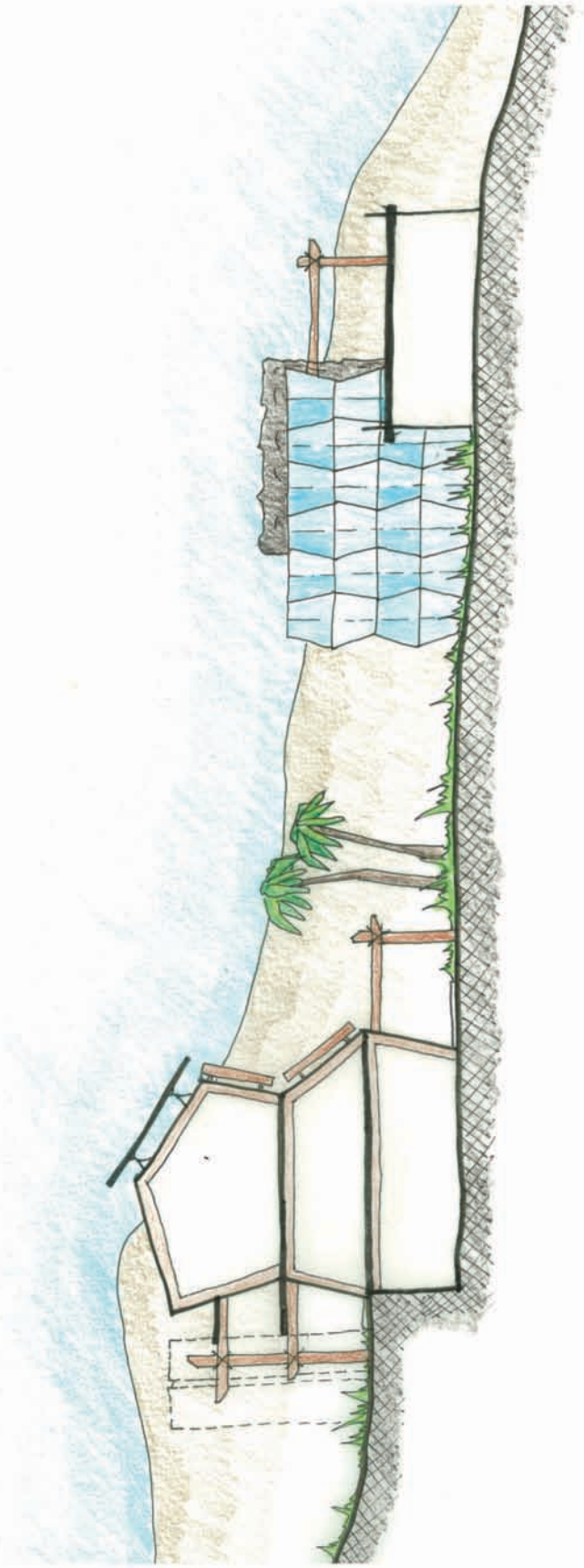
9.3.8 Part of the Natural Environment

In traditional Hawaiian culture, *hale* were built to be part of the natural landscape and not elements which dominated the landscape. Hawaiians did not have the technology to control their environments, so therefore had to adapt to living with the conditions given to them by Mother Nature. The buildings were therefore designed to be in harmony with nature, and their physical appearance reflected this idea. The building blended in with the fields and hillsides and trees, and essentially became a part of the natural landscape.

The unique form of the classroom pods was also derived from this same idea. The landscape of the project site is very rugged and filled with boulders and large outcrops of stone. In order to have the building fit in with this landscape, it was shaped to resemble these natural features. The materials may be different, but the forms are mimicking the natural beauty of the site, and thus preserving the traditional idea that a building should fit in with its surroundings.

(see diagrams on following two pages)

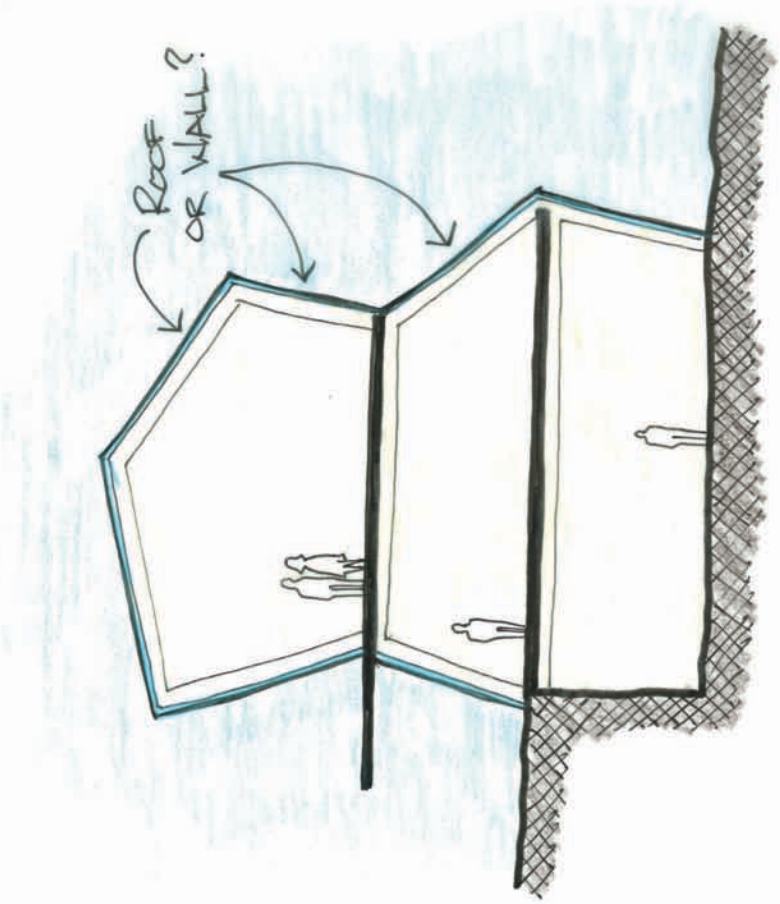

NATURAL FEATURES
NATURAL LANDSCAPE
CLASSROOM TOWER
LAB CLASSES
STAIR TOWER
BUILDING SITE SECTION / ELEVATION

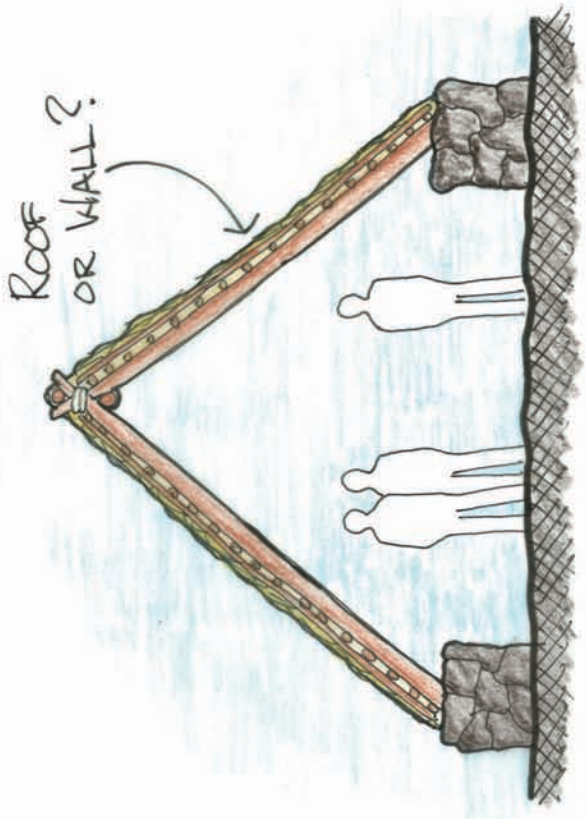


9.3.9 Representation of Traditional Volume

Another way of preserving traditional culture at the building planning level is through physical representation of traditional building spaces and volumes. One of these features in Hawaiian buildings is the interior space that results from the steep roof forms. The roofs of *hale* often either come all the way to the ground or are sitting on low walls. The result is a unique interior space where the line between a roof and a wall has been blurred. Sometimes one element simply provides the function of both roof and wall. This same idea and interior volumetric effect has been applied to the classroom tower within the classroom pod. The walls have been canted in a manner that creates a blurring effect of the boundary between what is a wall and what is a roof.

(see diagram on following page)


ROOF OR WALL?


ROOF OR WALL?

9.3.10 Respecting the Land

Every aspect of life for a Hawaiian living in traditional culture revolved nature and the land. Almost everything they ate, wore, and used for clothing, shelter, and tools came directly from the land. It is because of this reliance that they had such a strong sensibility towards the environment. They understood that the land had the power to give everything that was needed to sustain life, and at the same time had to power to take it all away if it wasn't properly cared for and respected.

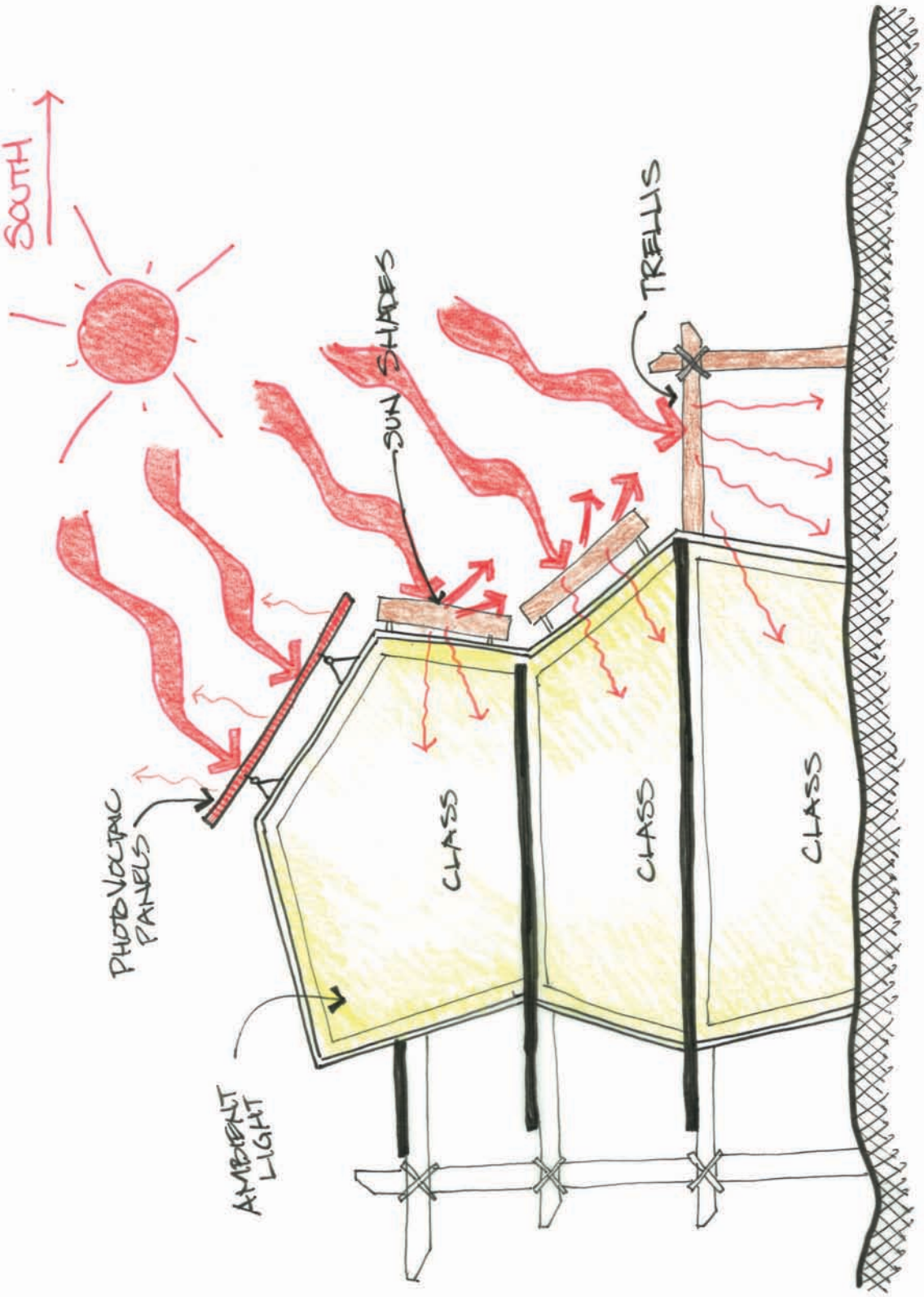
This profound respect for the land is a traditional cultural value that needs to be reflected in this building if it is to properly act as a tool for cultural preservation. One way this is being accomplished is through the use of passive lighting design. The classrooms are being naturally lit as much as possible through the extensive use of glazing on all sides of this building. Sun shades are in place to stop much of the direct sun light from entering the building during most of the time during the day that the school is in use. The result is an ambient light which is ideal for a classroom atmosphere and drastically reduces the need for electricity.

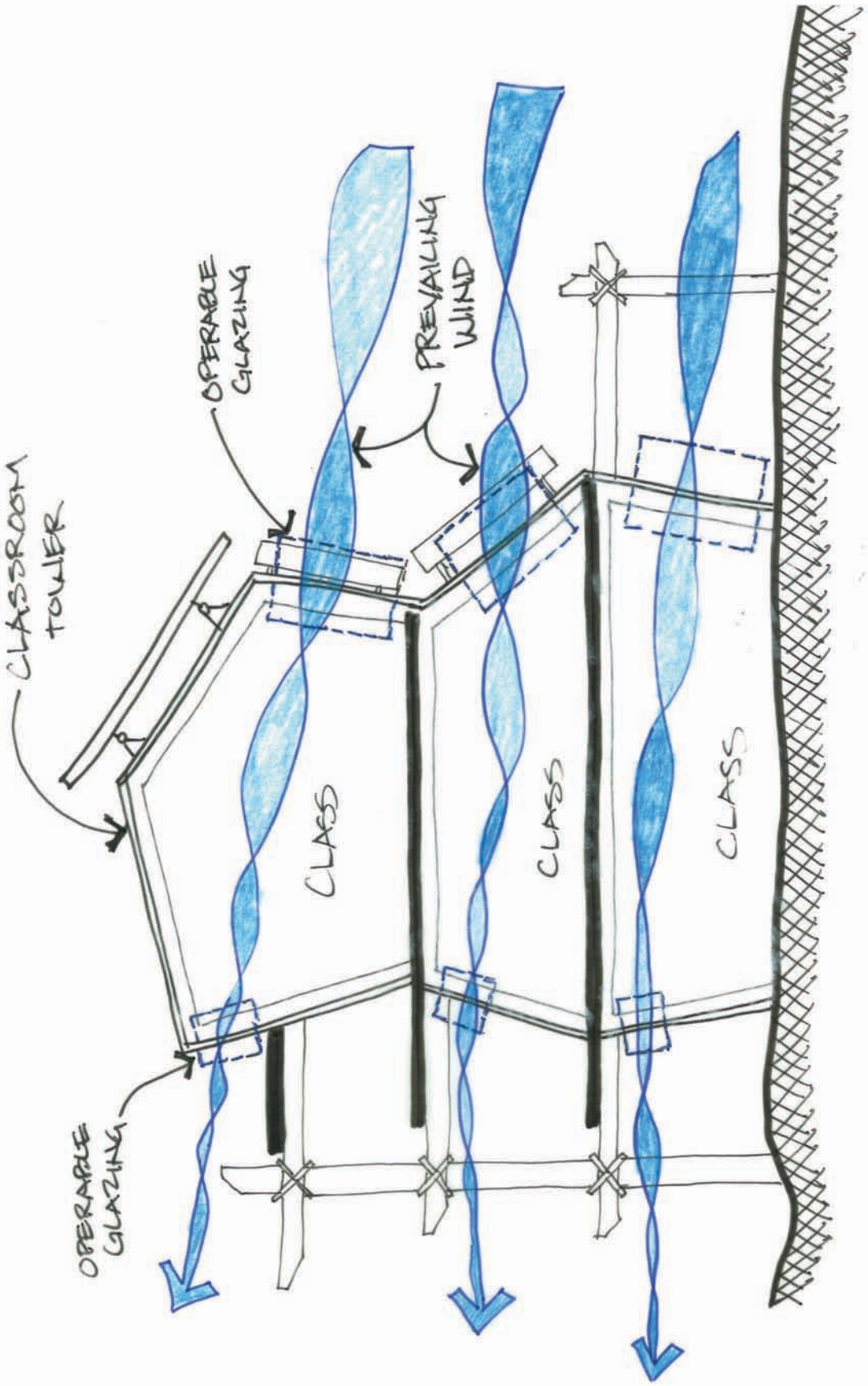
Another way in which the building is reflecting the respect for the land is through the use of passive cooling. The sun shades previously mentioned play a role in this, but the building is also open cooled through natural breezes. As the prevailing winds sweep through the valley, the "V" shape of the pods pulls the wind into is courtyard and into the classrooms. The glazing along the *makai* face of the classroom tower is almost completely operable. This, in combination with high operable windows on the *mauka* side, allows wind to flow freely through the spaces keeping them cool. By avoiding mechanically controlled interior environments, vast quantities of energy are saved and the building's impact on the land is minimized.

Although the heat energy from the sun is being avoided through the use of sun shades and trellises, the power provided by the sun is being harnessed by a photovoltaic array on top of the classroom tower. This array is then converting the suns energy to be used to operate the already-reduced energy load of the building.

The best way of reflecting this cultural value of environmental stewardship is through reducing the building's impact on the natural environment. Not only does this actively promote the sustenance of nature, but if made visible, these sustainable strategies can act as an education tool in promoting sustainability for generations to come.

(see diagrams on following two pages)

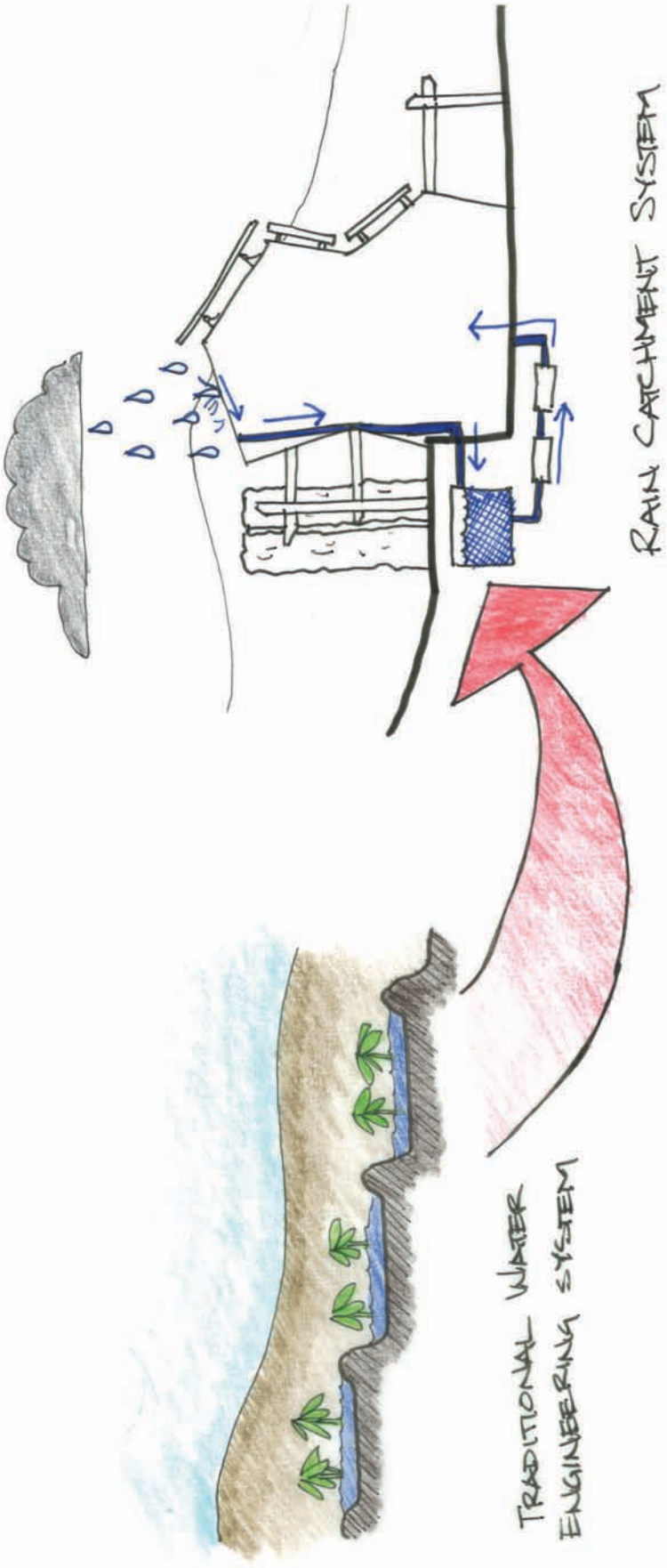

SOUTH
SUN SHADES
TRELLIS
PHOTOVOLTAIC PANELS
AMBIENT LIGHT
GLASS
GLASS
GLASS


CLASSROOM TOWER
OPERABLE GLAZING
PREVAILING WIND
CLASS
CLASS
CLASS
OPERABLE GLAZING

9.3.11 Traditional Technology Reinterpreted

As was discussed in the research, Hawaiians had developed very sophisticated water engineering techniques long before the period of Western contact. It was through these water engineering techniques that wetland taro was cultivated in the terraces above rivers and streams. These same water engineering techniques will be implemented in the agricultural land on the site, but more modern water engineering techniques are being utilized in the classroom tower. A water catchment system is being used to capture the rain water and re-use it for non-potable uses in the building. In addition to being a reinterpretation of the traditional technology, it is also one more way for the building to reduce its impact on the land and natural environment.

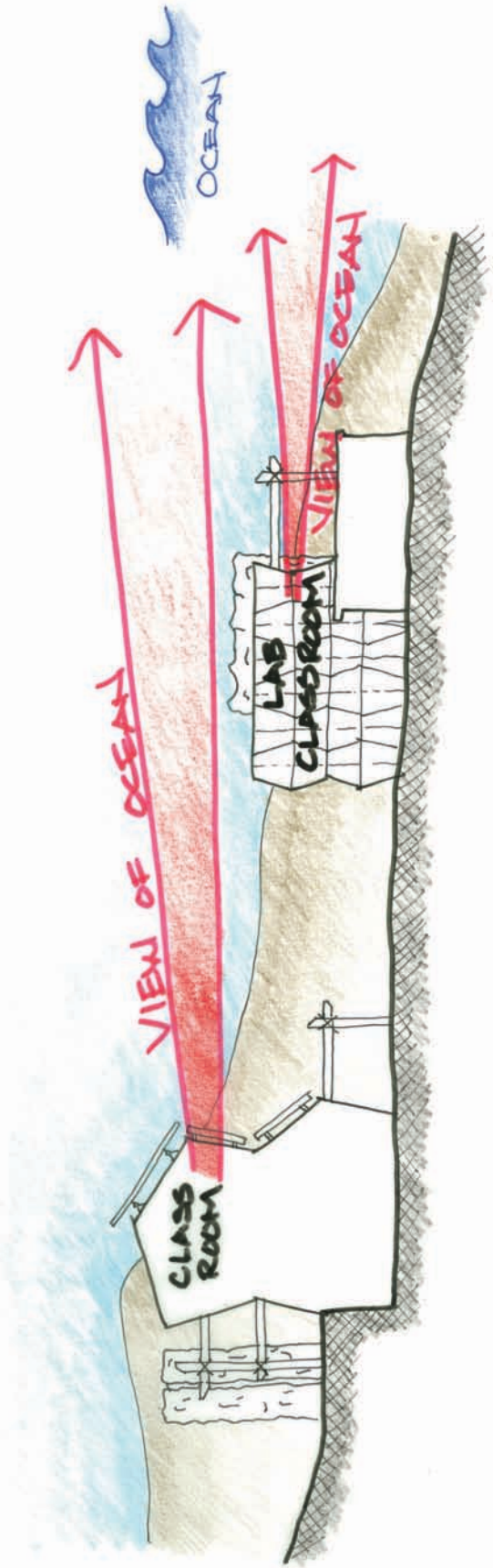
(see diagram on following page)


RAIN CATCHMENT SYSTEM
TRADITIONAL WATER ENGINEERING SYSTEM

9.3.12 Visual Connection to Ocean

The site is not located directly on the ocean, so it is difficult to maintain a physical relationship with the ocean. However, because a relationship with the ocean was identified as one of the major themes of the traditional culture, the ocean must somehow have an impact on the design of the school. This was done metaphorically through the seasonal pond and the "*kupuna* stones" set on a bed of coral. To enhance this relationship, the classroom pods have been designed in a way that will allow a view of the ocean from the top levels of classrooms and lab rooms from each pod. It is not a physical connection to the sea, but it is the best solution for this particular site.

(see diagram on following page)


OCEAN
VIEW OF OCEAN
VIEW OF OCEAN
LAB
CLASSROOM
CLASS
ROOM

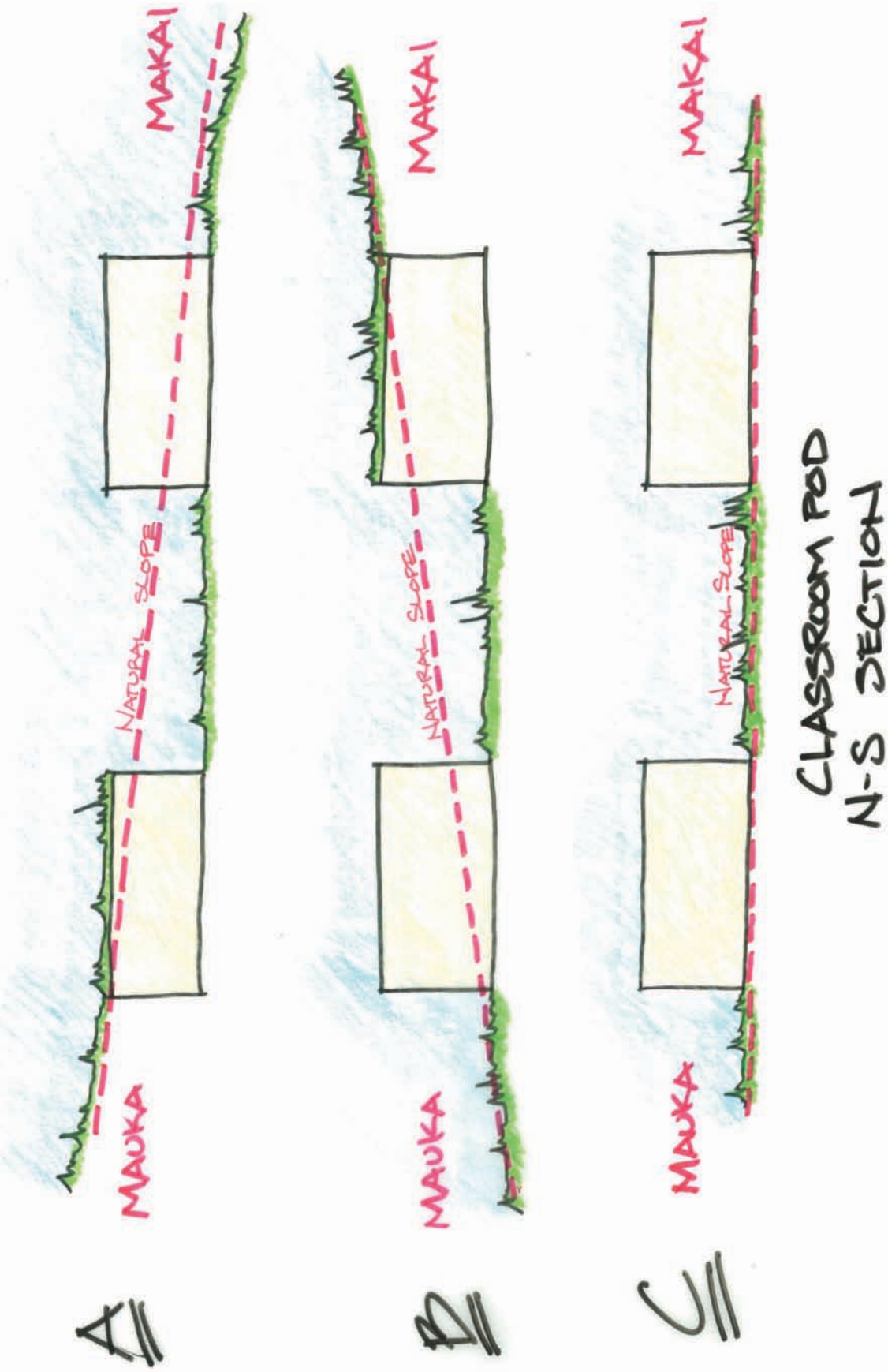
9.3.13 Working With the Topography

In order to further enhance the buildings' relationship with the site, it was important that the classroom pods became part of the topography of the land, and not just objects placed on top of the land. As can be seen on the site plan on the following page, the topography varies greatly on different portions of the site. This meant that the classroom pods, although programmatically identical, would have to each be different to allow for the building to properly work with its unique plot of land.

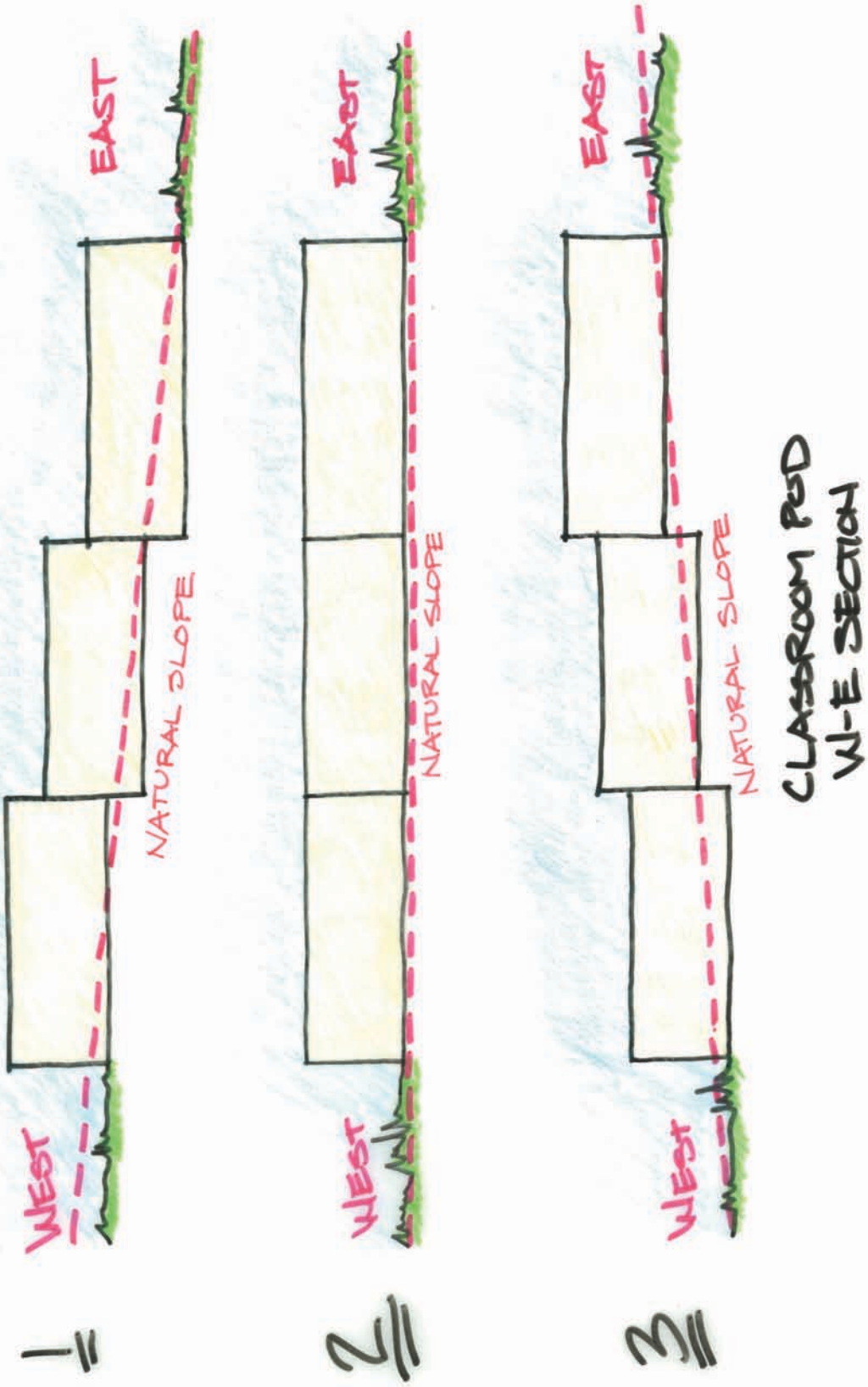
It was recognized that the topography for the individual classroom pods varies in slope in both the *mauka-makai* direction, and also the east-west direction. For the *mauka-makai* slope, there are three basic conditions of slope, which are (A) towards the ocean, (B) back towards the mountain, and (C) nearly flat. Therefore, three different pod conditions had to be developed to accommodate the different slopes. In the east-west direction, there are also three different conditions, which are (1) sloping towards the east, (2) flat, and (3) sloping towards the west. Again, this meant that three different pod conditions had to be developed to accommodate this change in topography. The final result is that each of the pods was assigned a letter and a number, creating a condition where each classroom pod is uniquely working with the land upon which it sits.

(see site plan on following page and topography diagrams on the two pages after)


AG LAND
AG ARTS
LANDSCAPE ARTS
HOTEL
CANOE VIEW
HUMANITIES ARTS
PERFORMING ARTS
DIGITAL ARTS
MUSEUM ARTS
ARCHIVE
ADMIN & LOBBY
POND
LIBRARY
AUDITORIUM
CAFETERIA
MULTI-PURPOSE
MULTI-PURPOSE
PERFORMING SPACE
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS
CLASS



CLASSROOM POD
N-S SECTION


EAST
NATURAL SLOPE
WEST
1"
EAST
NATURAL SLOPE
WEST
2"
EAST
NATURAL SLOPE
WEST
3"
CLASSROOM POD
W-E SECTION

9.3.14 Implementing the Topography Changes

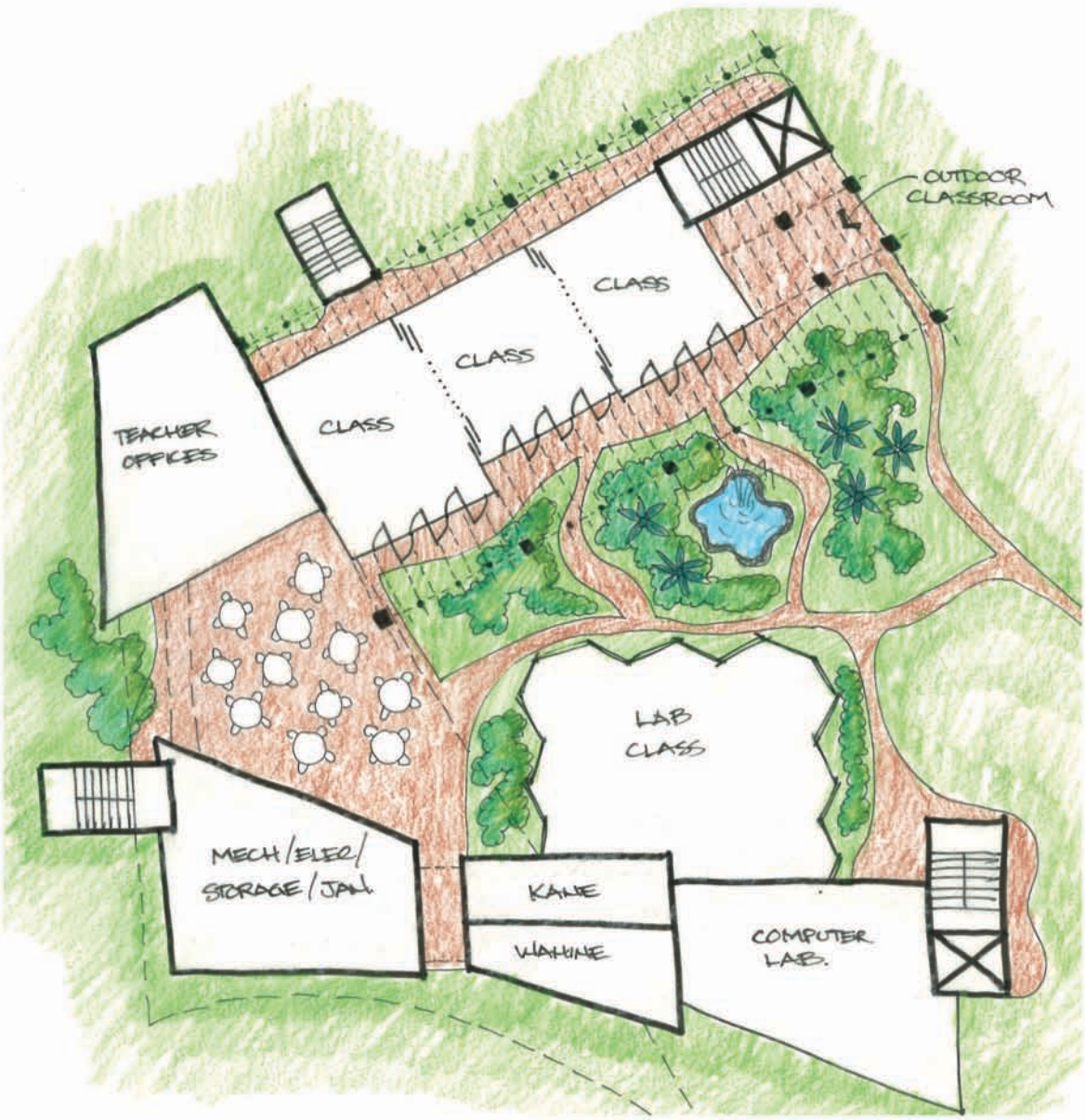
As a result of having many different conditions of topography, different floor plans had to be developed. There are three basic floor plans which accommodate the *mauka-makai* differences in slope, and a different section to accompany each. The slope in the east-west direction did not affect the layout of the floor plan, however just required that one of the wings steps up or down to move with the land.

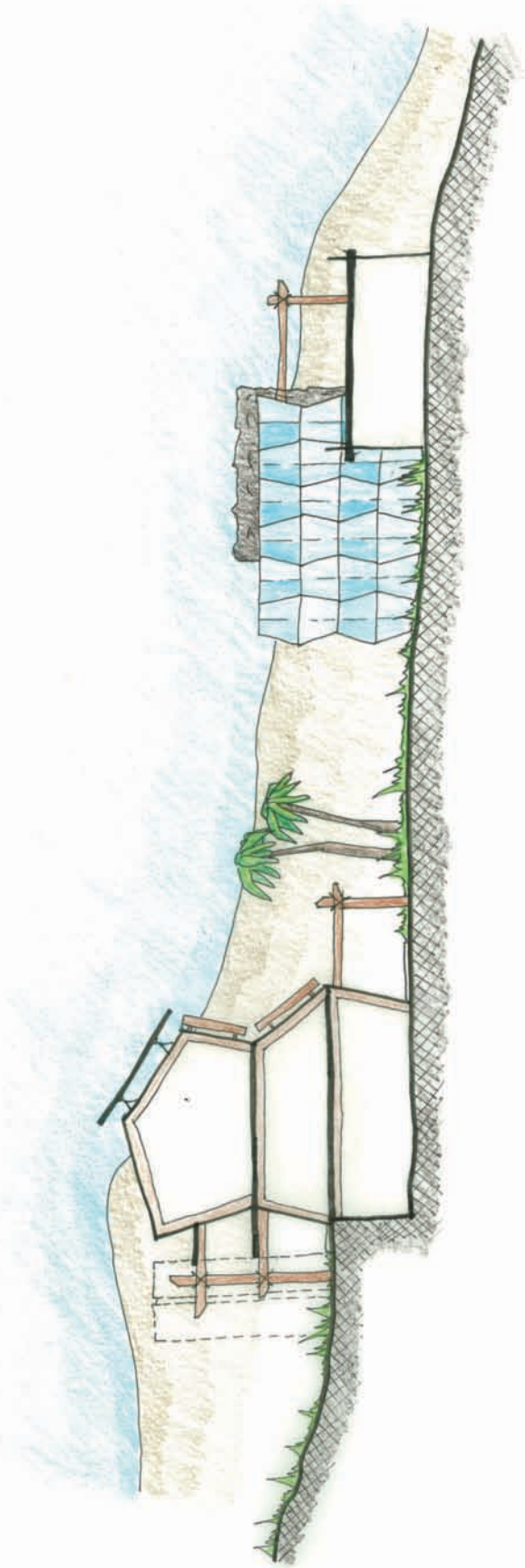
On the following six pages, the ground floor plans and their corresponding sections are shown for the different *mauka-makai* slope conditions. Essentially, this is showing an example of how a building with multiple replications can be slightly modified to become more involved with the natural flow of the land instead of simply placing the same building on top of the land over and over again. By keeping this better relationship with the natural topography, the buildings are being more culturally sensitive and respectful of the surroundings.

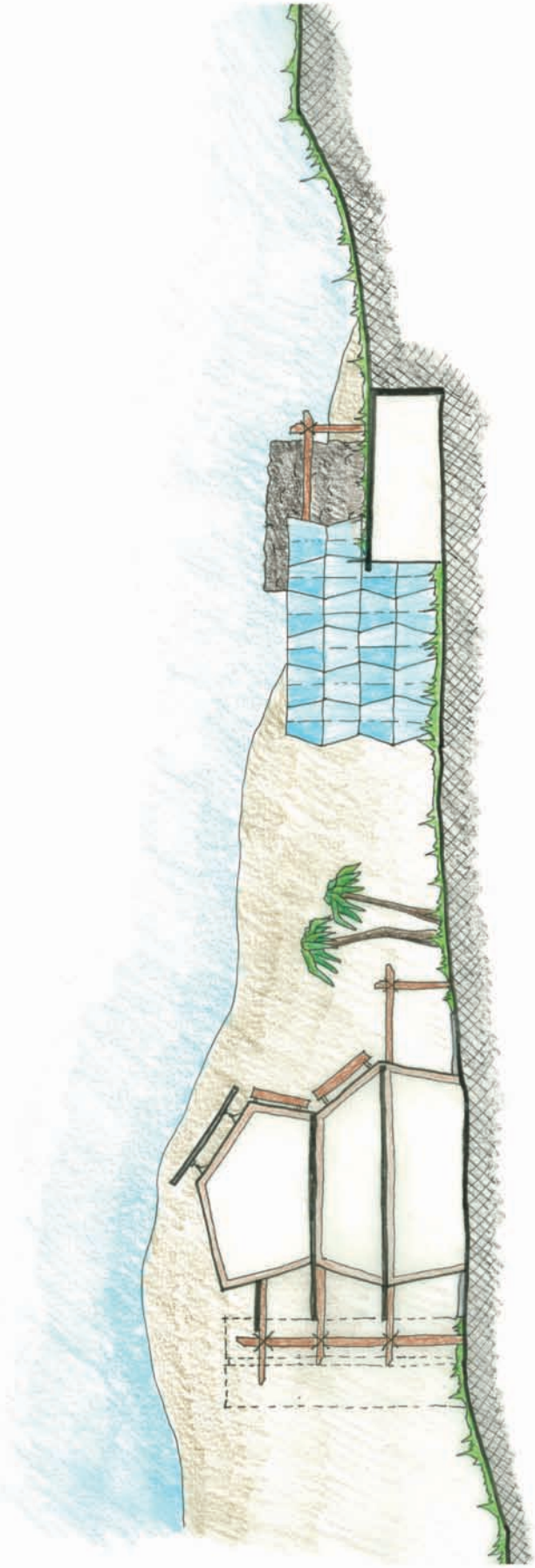
(see plans and sections on following six pages)

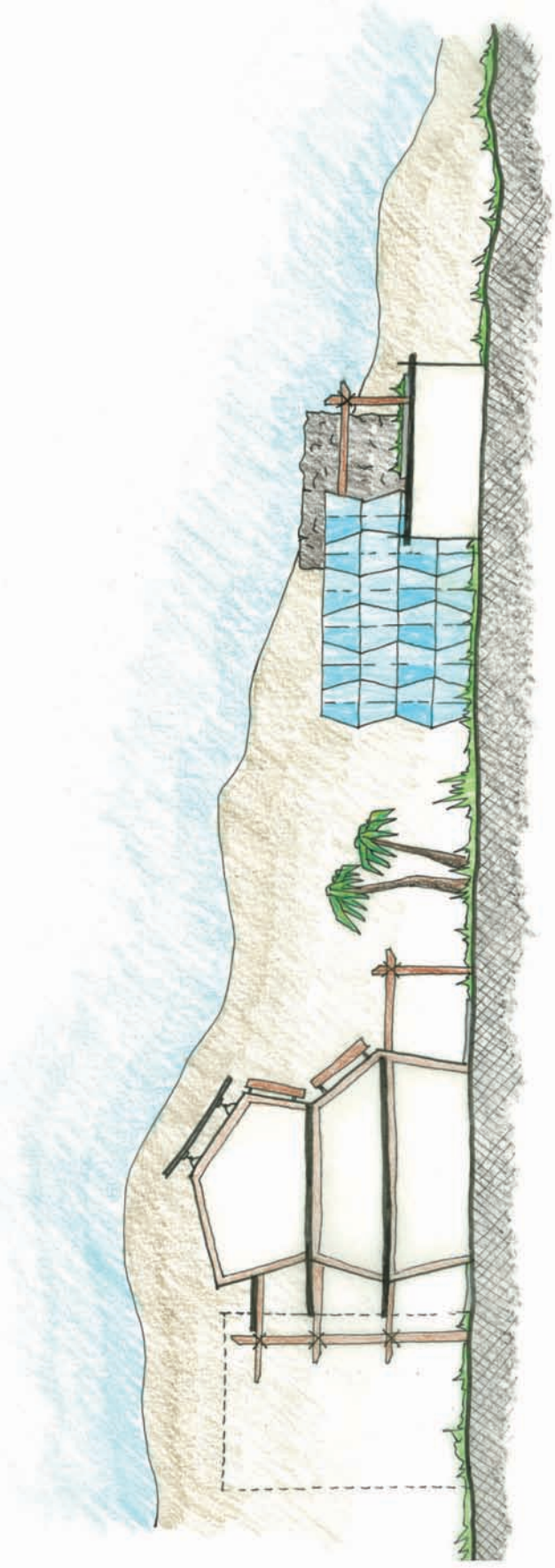

OUTDOOR CLASS
CLASS
CLASS
CLASS
MECH /ELEC/ STOR/ JAN.
LAB CLASS
TEACHER OFFICES
KANE
WAHINE
COMPUTER LAB


OUTDOOR CLASS
CLASS
CLASS
CLASS
MECH. / ELEC. / STORAGE / JAN.
LAB CLASS
COMPUTER LAB
KANE
WAHINE
TEACHER OFFICES


OUTDOOR CLASSROOM
CLASS
CLASS
CLASS
TEACHER OFFICES
LAB CLASS
MECH/ELEC/ STORAGE/JAN.
KAHE
WAHINE
COMPUTER LAB.



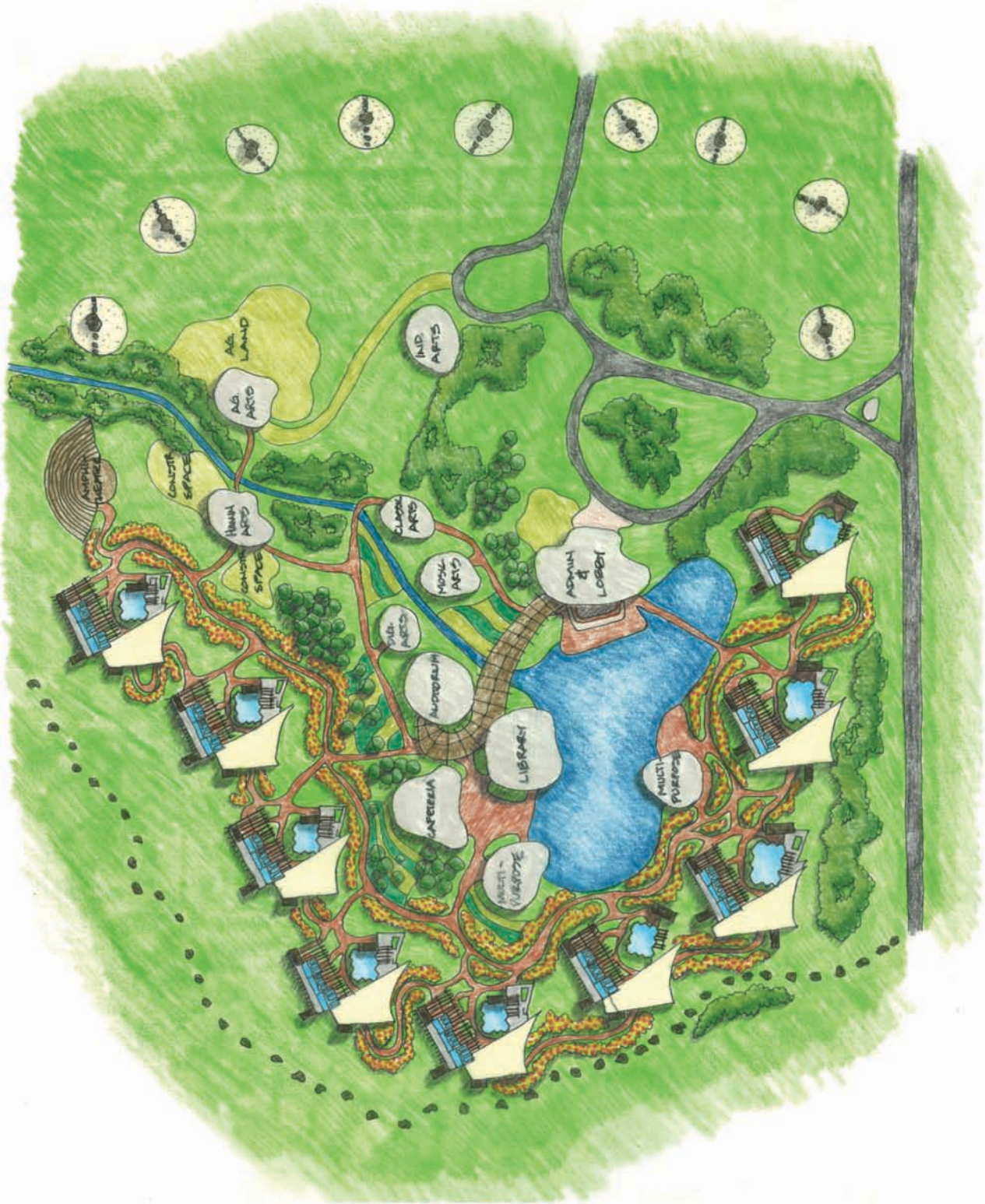




9.3.15 Buildings on Site

The classroom pods have not yet been designed to a finished state. However, a general form and shape on the landscape has been developed by implementing the building planning strategies in the Cultural Design Methodology. As can be seen on the following page, these pods have now been combined with the site planning strategies. If this same process was used to develop the remaining buildings on the campus, the result will be a well-developed master plan for the high school.

(see diagram on following page)


AG. LAND
AG. ARTS
LAND ARTS
AMPHI THEATRE
COVERED SPACE
HUMAN ARTS
COVERED SPACE
CLASSIC ARTS
MODEL ARTS
PUBLIC ARTS
AUDITORIUM
ADMIN & LOBBY
LIBRARY
CAFETERIA
MULTI PURPOSE
MULTI PURPOSE

9.4 Architectural Features

9.4.1 Architectural Features Introduction

Architectural Features are individual elements of the design that have been developed based upon the Cultural Design Methodology. They are not elements that were involved with the overall site planning or space planning of individual buildings. They are more or less features that have been designed to help preserve cultural ideas at a more detailed level. Following are examples of how these architectural features could be applied to the design of this high school.

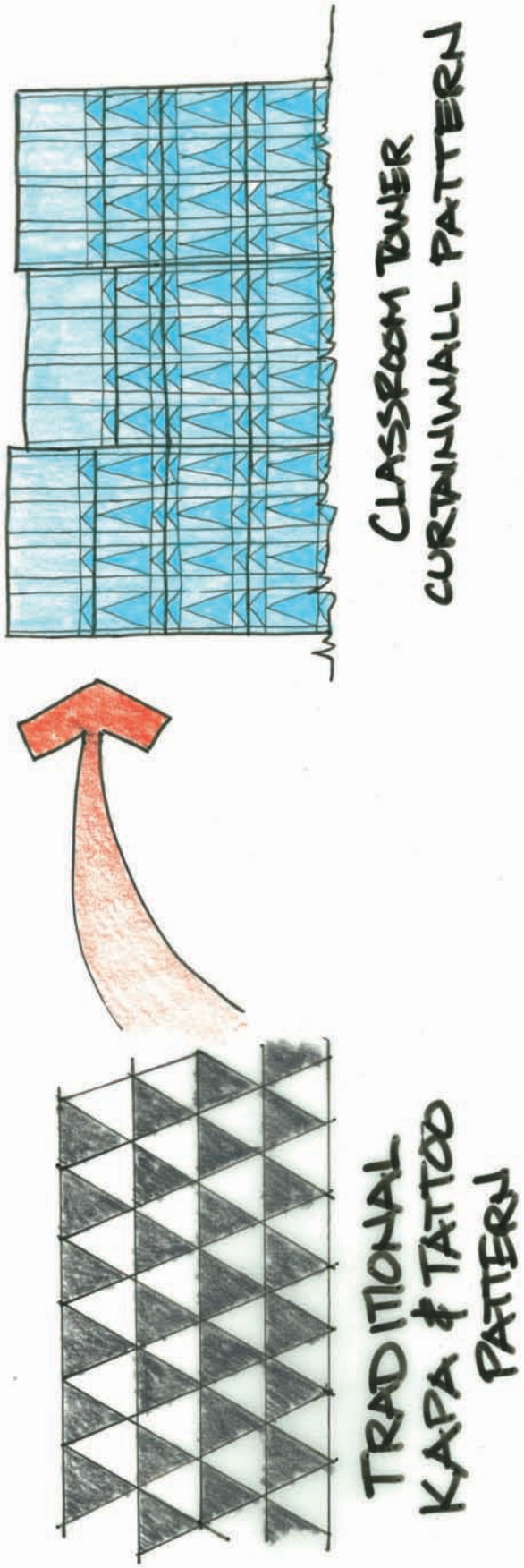
9.4.2 Simple Pattern Introduced on Façade

A very common and simple pattern often found in various crafts of Hawaii is the repeating triangle. This pattern is repeatedly found on traditional *kapa* and tattoos. As discussed in the Cultural Design Methodology, it is never a good idea to create exact copies of traditional patterns, as this will most likely result in misinterpreting the actual meaning of the pattern and ultimately be an inappropriate application of the pattern. Instead, it is a much better idea to reinterpret a pattern in a very generic way that is open to viewer interpretation. In this way, a triangle pattern has been designed into the façade of the classroom towers in the classroom pods. The traditional repeating triangle pattern was not copied, and instead a generic pattern which reflects similar geometry has been applied.

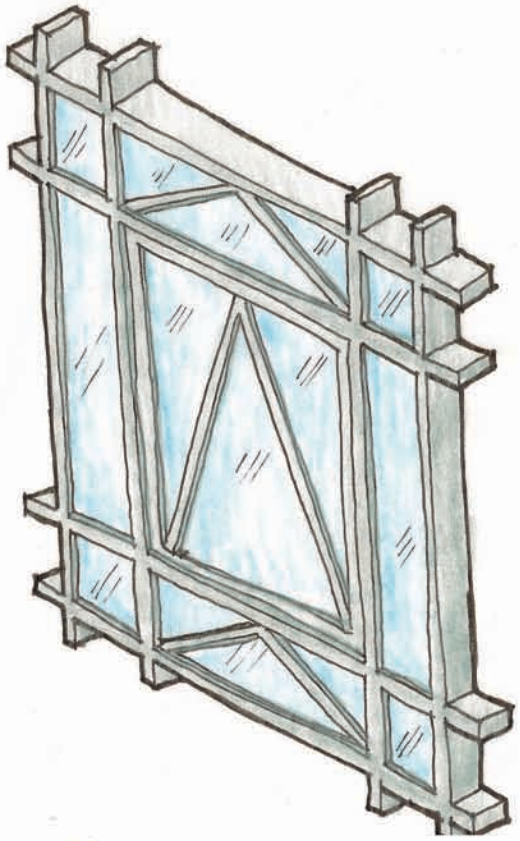
A small portion of the curtain wall has been developed to demonstrate how this pattern would actually be implemented. As was discussed previously, the curtain wall is to contain operable glazing to ensure that the building can be at least partially naturally

cooled and ventilated. It must also be safe and meet code so that nobody will accidentally fall out. This is why there are three horizontal bands on the curtain wall at each floor level. The lower band acts as a guardrail and is not operable. The large central band has a pivoting window to allow for maximum opening size, and extends from the guardrail portion up to the ceiling. The upper band looks like the lower band, but is made up of spandrel glass which hides the floor/ceiling structure. The triangular pattern is then created simply by using diagonal mullions for dividing the glass. When repeated across the entire façade of the classroom tower, the triangular pattern will emerge which is abstractly representative of the simple triangle pattern found in tapa and tattoos.

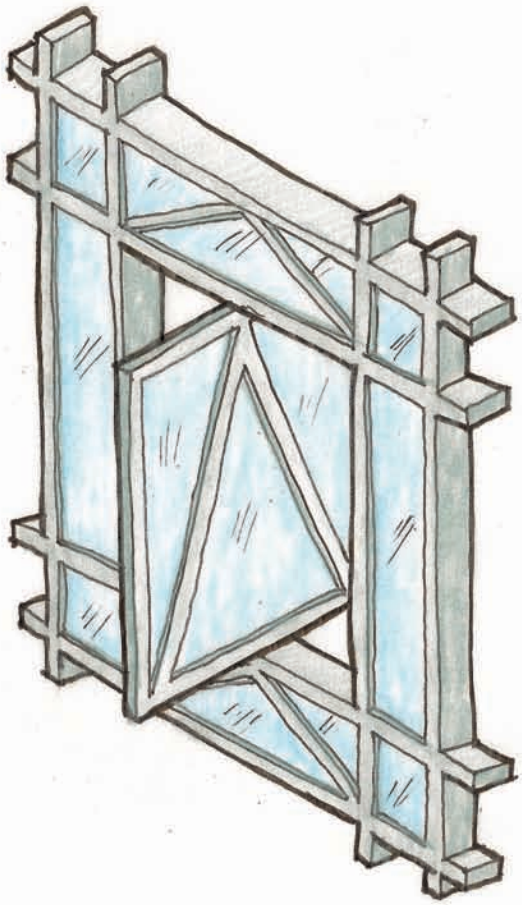
(see diagrams on following two pages)


CLASSROOM TOWER
CURTAINWALL PATTERN
TRADITIONAL
KAPA & TATTOO
PATTERN

CURTAIN WALL (CLOSED)



CURTAIN WALL (OPEN)

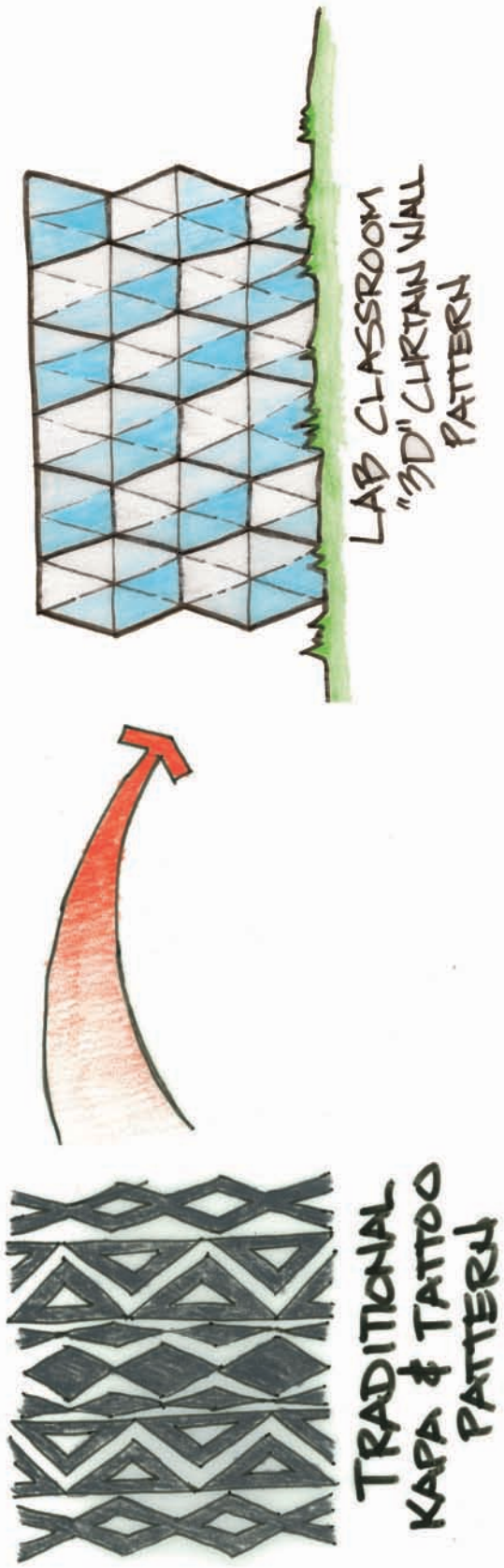


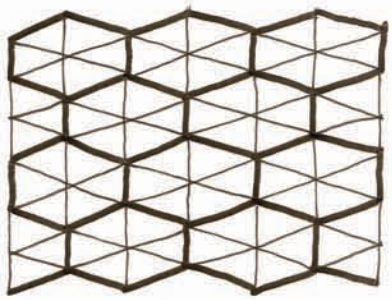
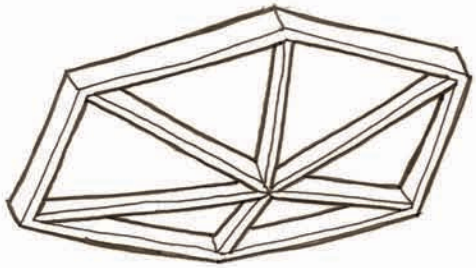
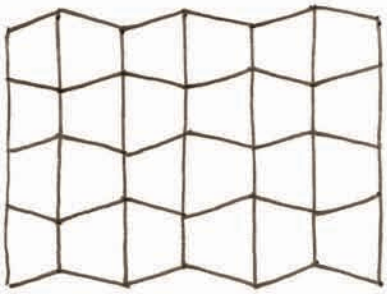
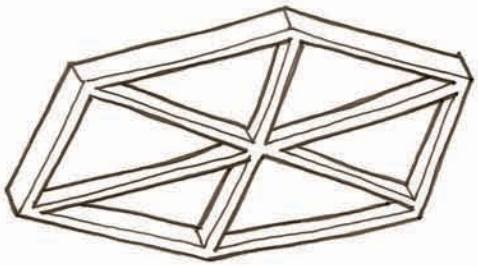
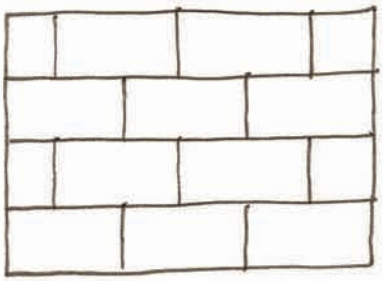
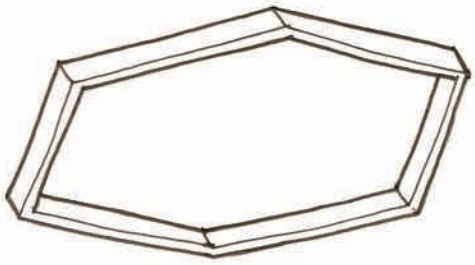
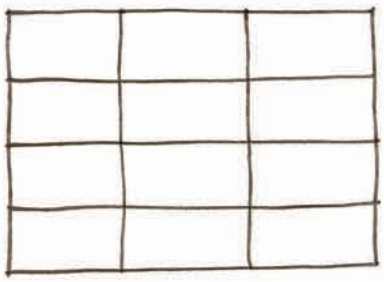
9.4.3 Complex Patterns

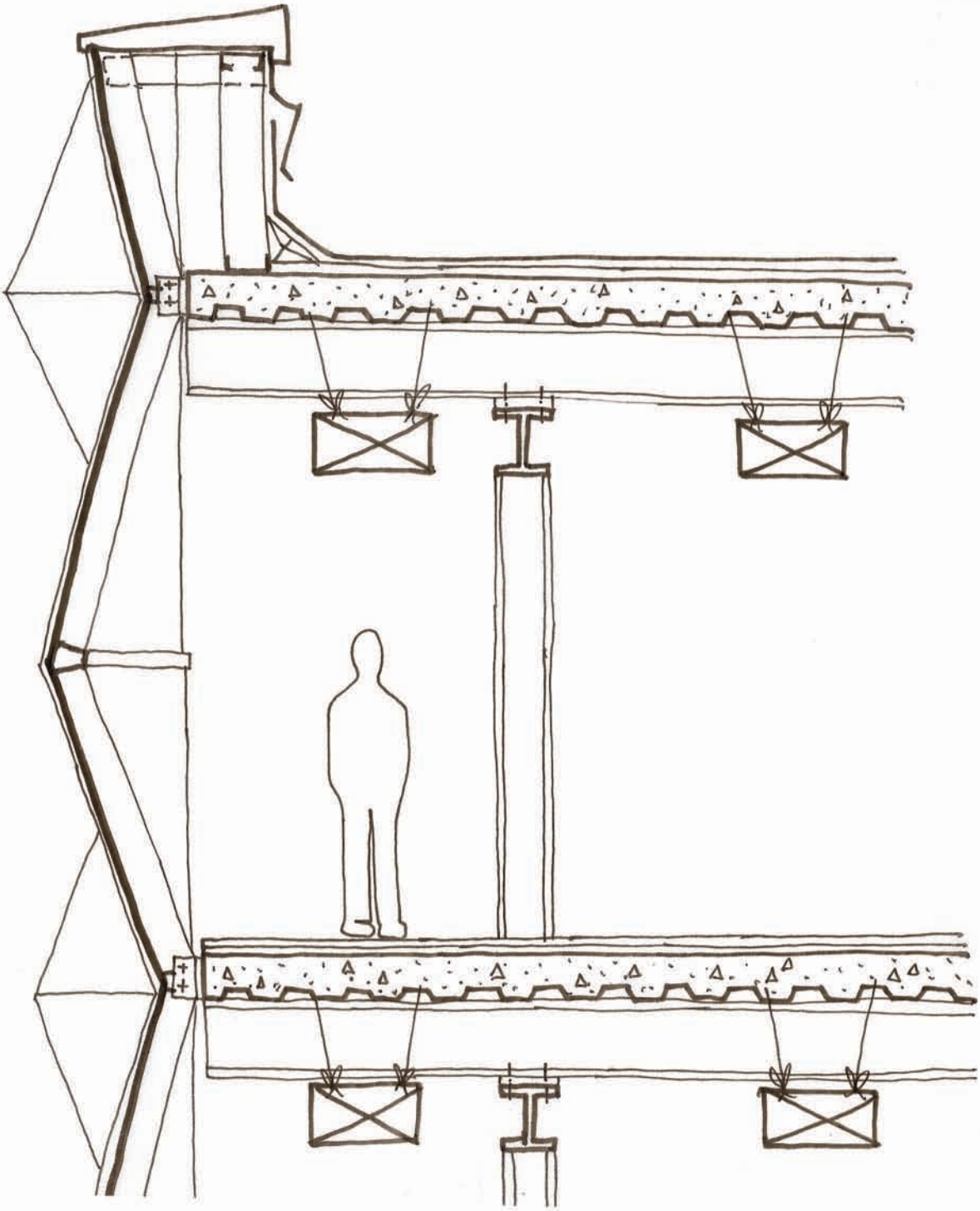
Traditional patterns are not always as simple as a repeating triangle and may in fact be much more complex. An example of a more complex Hawaiian pattern is found on the following page. Again, rather than trying to mimic it exactly, it has been very abstractly represented in a unique geometric format that is three-dimensional. The 3-D pattern has been applied to a glazing pattern that is found on the lab classrooms in the classroom pods.

Although the complexity may make it seem like a difficult curtain wall to construct, it is not as complex as it may seem. A standard curtain wall mullion pattern would typically consist of rectangular sections of glass which are in horizontal alignment with each other. This 3-D curtain wall started with this simple glazing pattern and was evolved one step at a time to ensure constructability. First, the horizontal mullions were staggered. Then the vertical mullions were angled to create a slight zigzag pattern, still relatively easily to manufacture and construct. These zigzags create a hexagonal pattern which becomes the basic structural framework for the curtain wall. The dividing mullions, rather than being on an equal plane with the hexagon, are extruded away from the surface of the wall, creating a pyramid-like form. This pattern then repeats itself throughout the façade. Although it requires custom fabrications, the repetition on the building as well as throughout all nine pods on campus makes it feasible for manufacturing and construction. Diagrams showing this evolution of form and a schematic wall section are shown on the following pages.

(see diagrams on following three pages)


LAB CLASSROOM
"3D" CURTAIN WALL
PATTERN
TRADITIONAL
KAPA & TATTOO
PATTERN

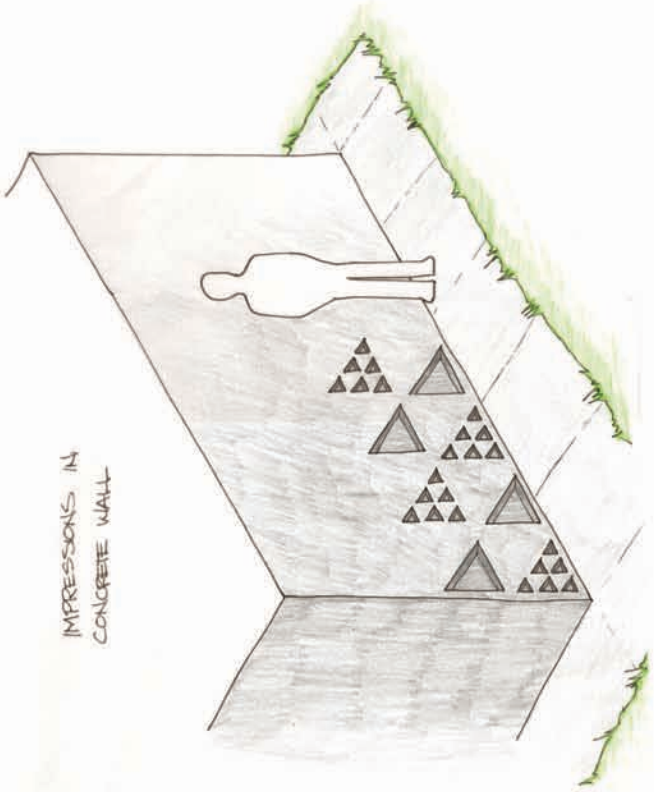



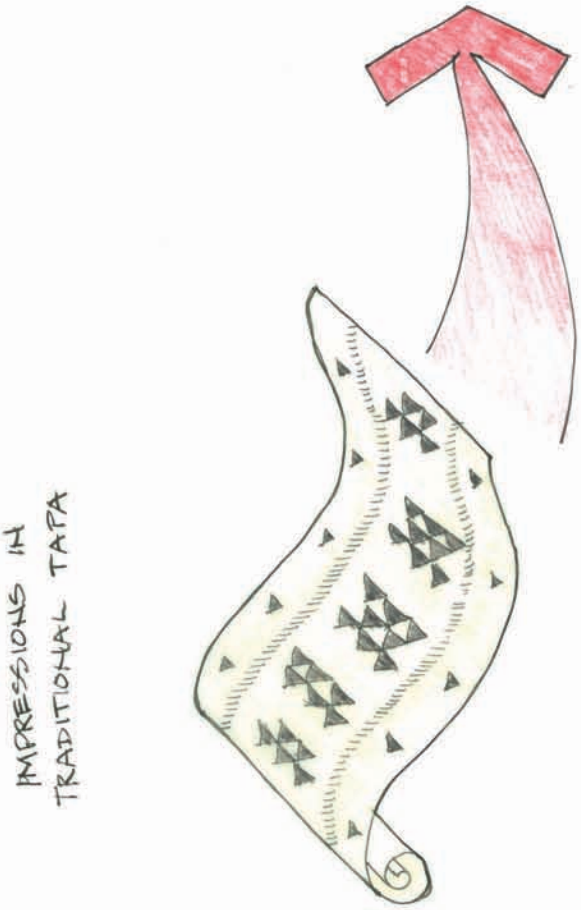
9.4.4 Traditional Textures

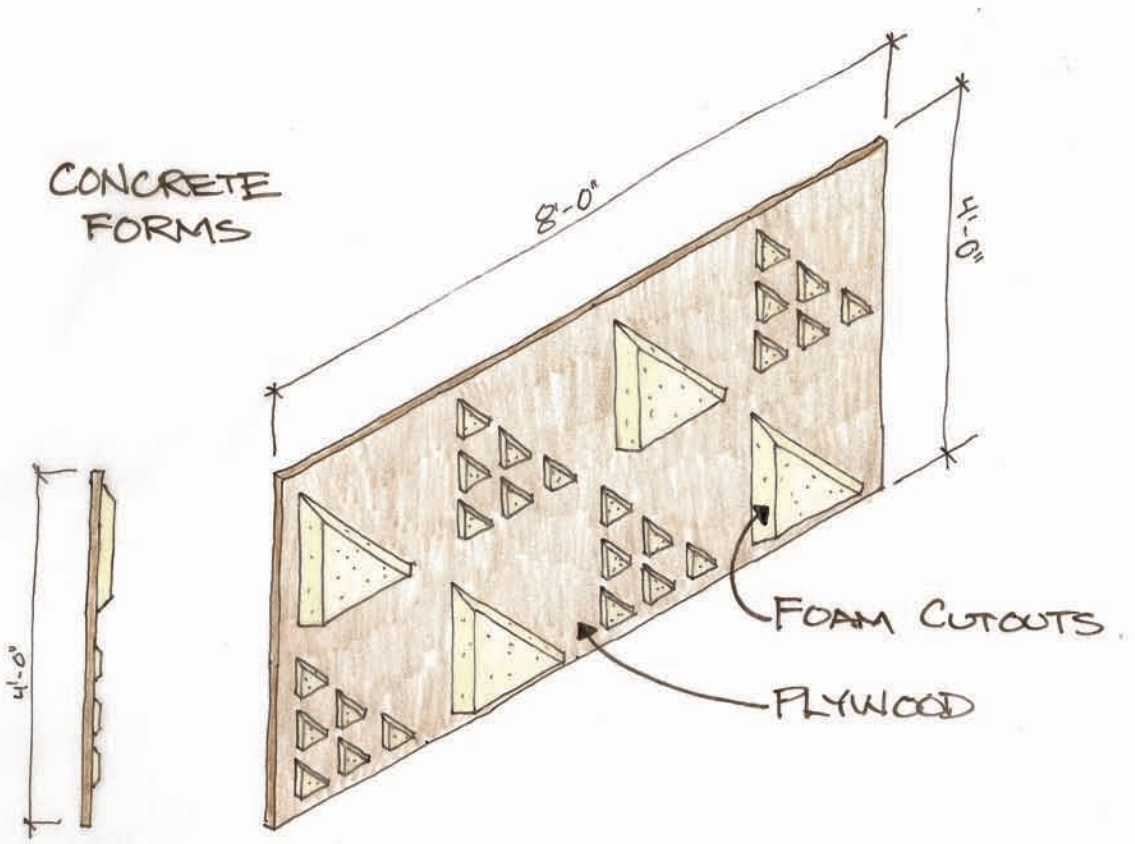
Architecture is experiential and not something that is only viewed from a distance. Incorporating textures to use the sense of touch is a way of enhancing the architectural experience. Within a traditional culture, there are undoubtedly many common textures. In Hawaiian culture, one of these textures is in the patterns found on *kapa*. These patterns were not just painted on, but physically stamped into the *kapa,* physically representative of how a tattoo would be impressed into the human skin.

In this building, there are many instances of concrete on the exterior façade of the building. Concrete is a molded form and therefore a great opportunity to recreate these impressions. An example of this is shown where a generic triangle pattern is being used to create physical impressions in the skin of the building, representative of how impressions would be made in the skin of a human or on traditional *kapa*. Creating these impressions in concrete is accomplished rather easily by adding foam cutouts to standard sized concrete formwork.

(see diagrams on following two pages)


IMPRESSIONS IN
CONCRETE WALL


IMPRESSIONS IN
TRADITIONAL TAPA

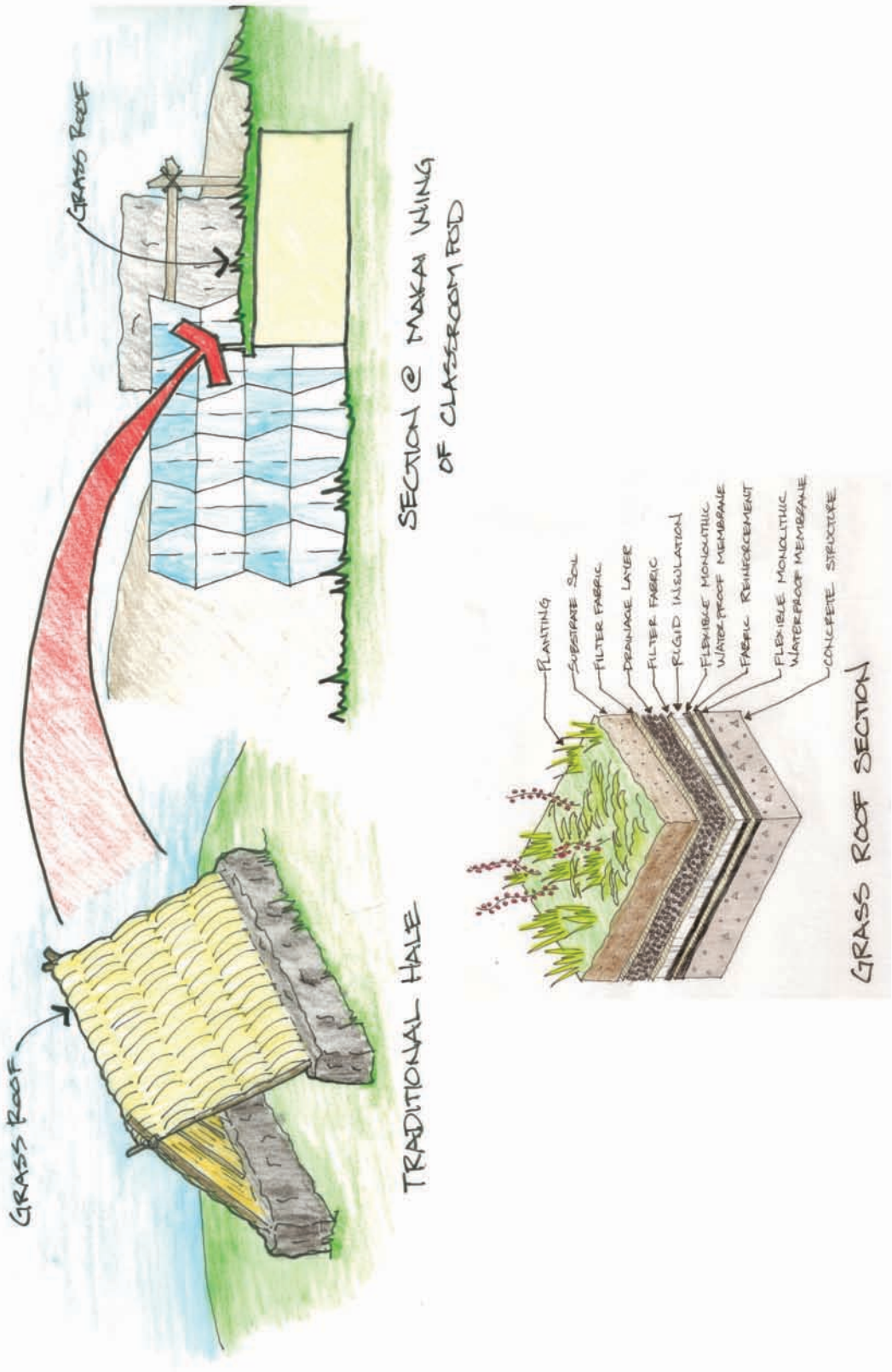

CONCRETE FORMS
8'-0"
4'-0"
4'-0"
FOAM CUTOUTS
PLYWOOD

9.4.5 Material Interpretation

One of the most recognizable features of a traditional *hale* is the grass roof. Although materials for roof coverings varied slightly from place to place, *pili* grass was the most commonly used material. It does not make sense to use a traditionally thatched *pili*-grass roof for this high school as there are modern materials which serve the purpose much more effectively and efficiently. However, the idea of a grass roof has been replicated in the classroom pod by designing portions of it with sod roofs. The part of the roof which has been covered with sod varies depending on the surrounding topography as discussed earlier. Regardless of the location, having a grass roof is a way of interpreting the traditional material in a way that bears a resemblance with history, and at the same time is a fully functioning contemporary roof.

Sod roofs are relatively common in contemporary architecture. There are many different ways of constructing them, and they can either be extensive or intensive, depending upon whether or not they are intended for public access and use. Because this roof will be used as outdoor classroom area, it needs to be intensive. This type of roof contains many different layers with the intent of providing proper soil depth for growing plants, drainage layers to whisk away moisture, and waterproofing to protect the building structure. A section showing these layers is shown on the following page.

(see diagram on following page)

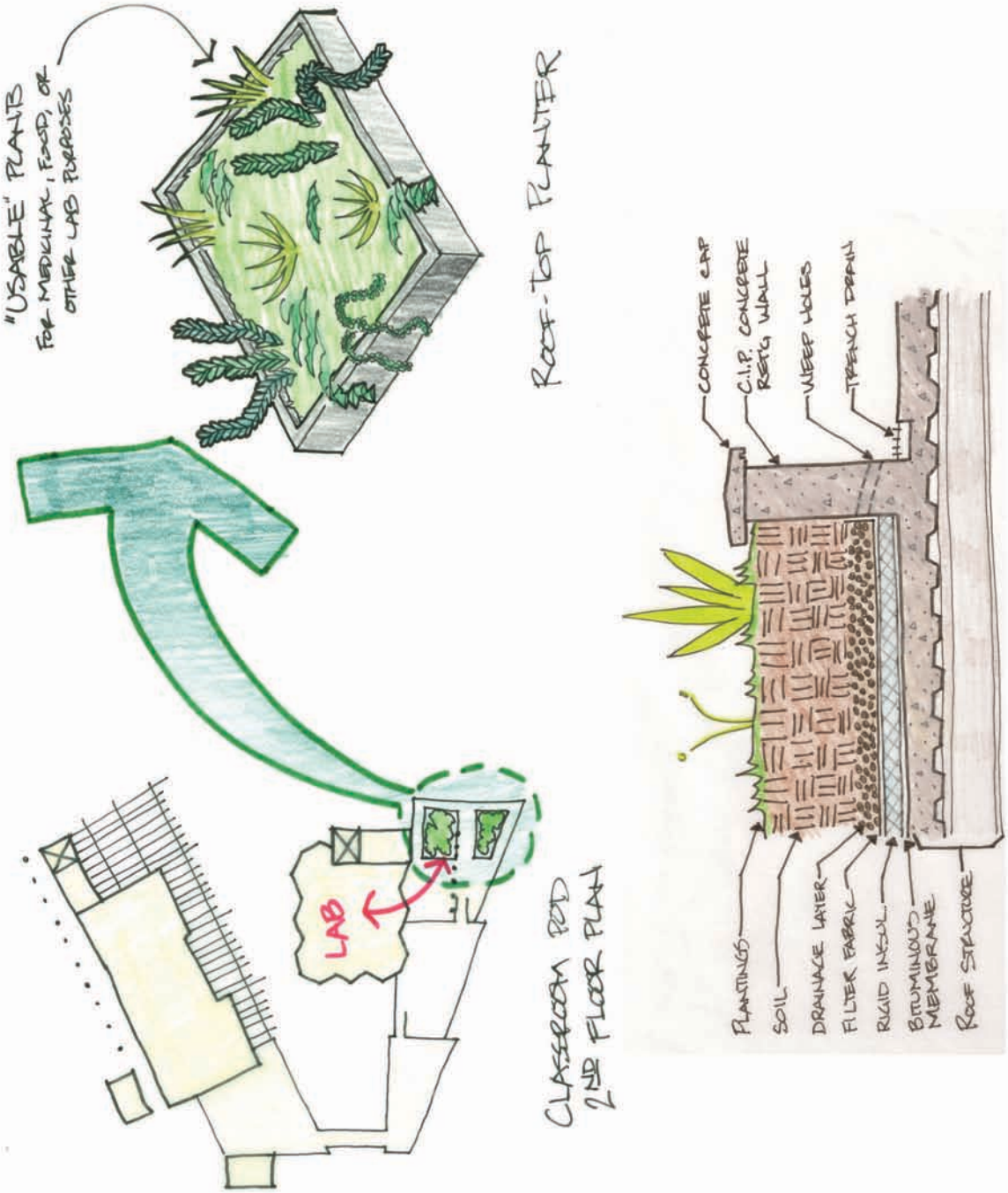

GRASS ROOF
SECTION @ MAKAI WING
OF CLASSROOM POD
GRASS ROOF
TRADITIONAL HALE
PLANTING
SUBSTRATE SOIL
FILTER FABRIC
DRAINAGE LAYER
FILTER FABRIC
RIGID INSULATION
FLEXIBLE MONOLITHIC
WATER-PROOF MEMBRANE
FABRIC REINFORCEMENT
FLEXIBLE MONOLITHIC
WATERPROOF MEMBRANE
CONCRETE STRUCTURE
GRASS ROOF SECTION

9.4.6 Functional Feature

An architectural feature can also be introduced which is not only aesthetically pleasing by also functional. As mentioned in the research section of this project, plants were used by Hawaiians for all types of purposes, including a vast array of medicines derived from various types of plants. It is for this reason that planters have been incorporated into the classroom pods directly adjacent to the lab classrooms. Here, plants for medicinal or other scientific uses can be grown and used in the labs. In addition to being completely functional, these planters are also an aesthetically pleasing way of incorporating a feature of the traditional culture.

The planter is constructed in a similar manner to the sod roof described previously. The difference is that it is fully contained within concrete retaining walls instead of flowing out onto the natural landscape. To accommodate this, weep holes are added to the retaining wall which flow into a trench drain surrounding the planter. To add even more function to this feature, a concrete cap has been included on top of the retaining wall to provide additional seating on the rooftop level.

(see diagram on following page)


"USABLE" PLANTS
FOR MEDICINAL, FOOD, OR
OTHER LAB PURPOSES
ROOF-TOP PLANTER
LAB
CLASSROOM POD
2ND FLOOR PLAN
CONCRETE CAP
C.I.P. CONCRETE
RETG. WALL
WEEP HOLES
TRENCH DRAIN
PLANTINGS
SOIL
DRAINAGE LAYER
FILTER FABRIC
RIGID INSUL.
BITUMINOUS
MEMBRANE
ROOF STRUCTURE

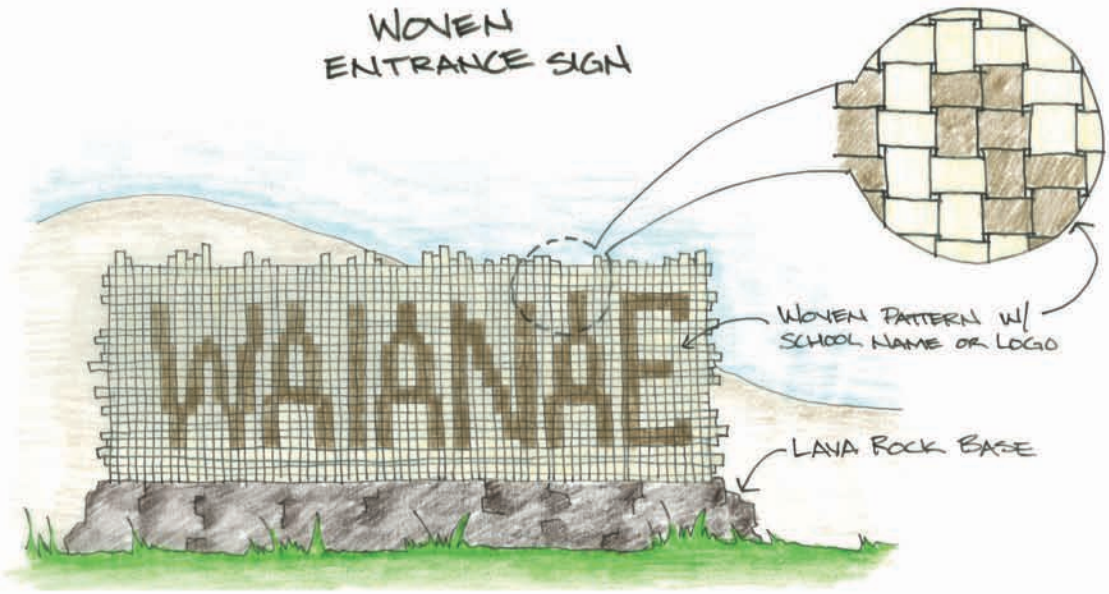
9.4.7 Craft Interpretation

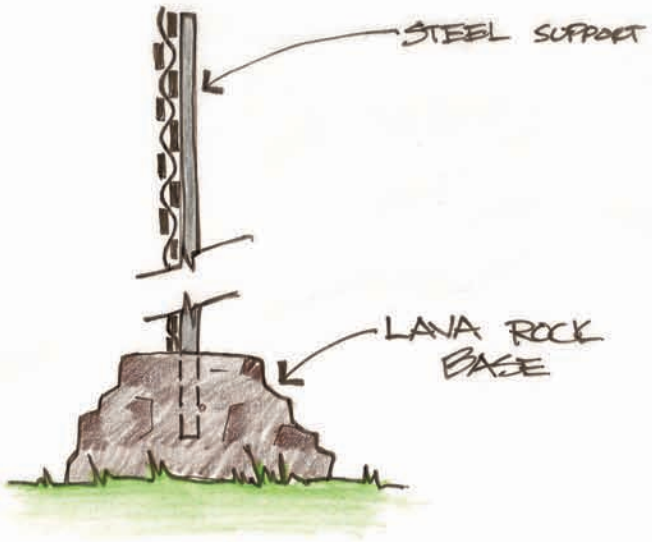
As discussed in the Cultural Design Methodology, recalling traditional crafts in an architectural design is an excellent way of recreating a visual reminder of traditional culture and history. One of the crafts that was important to Hawaiian culture was weaving, as this was the typical floor covering of hale for sleeping, and also had other applications such as the sails of canoes. The weaving was also known for the interwoven details and patterns.

This craft has been interpreted into a contemporary form in this high school. The main entrance sign for the school has been designed to be made of metal strips which are woven together. A pattern which forms either the name of the school, the logo, or something similar is incorporated into the weaving. The sign will be the first impression of people as they first enter the school or even just drive by, so using an easily recognizable traditional craft is a way of making sure that “traditional culture” is the message being sent.

The woven sign is constructed by first creating a solid base of lava rock. The lave rock is used as this is also very representative of traditional Hawaiian built forms. Steel rods are extended from the lava rock base acting as the support for the sign. The woven metal strips are welded together and also the steel support rods. The construction requires skilled labor, but is not overly complex for someone experienced in metal working and welding.

(see diagram on following page)


WOVEN
ENTRANCE SIGN
WAIANAE
WOVEN PATTERN W/
SCHOOL NAME OR LOGO
LAVA ROCK BASE


STEEL SUPPORT
LAVA ROCK
BASE

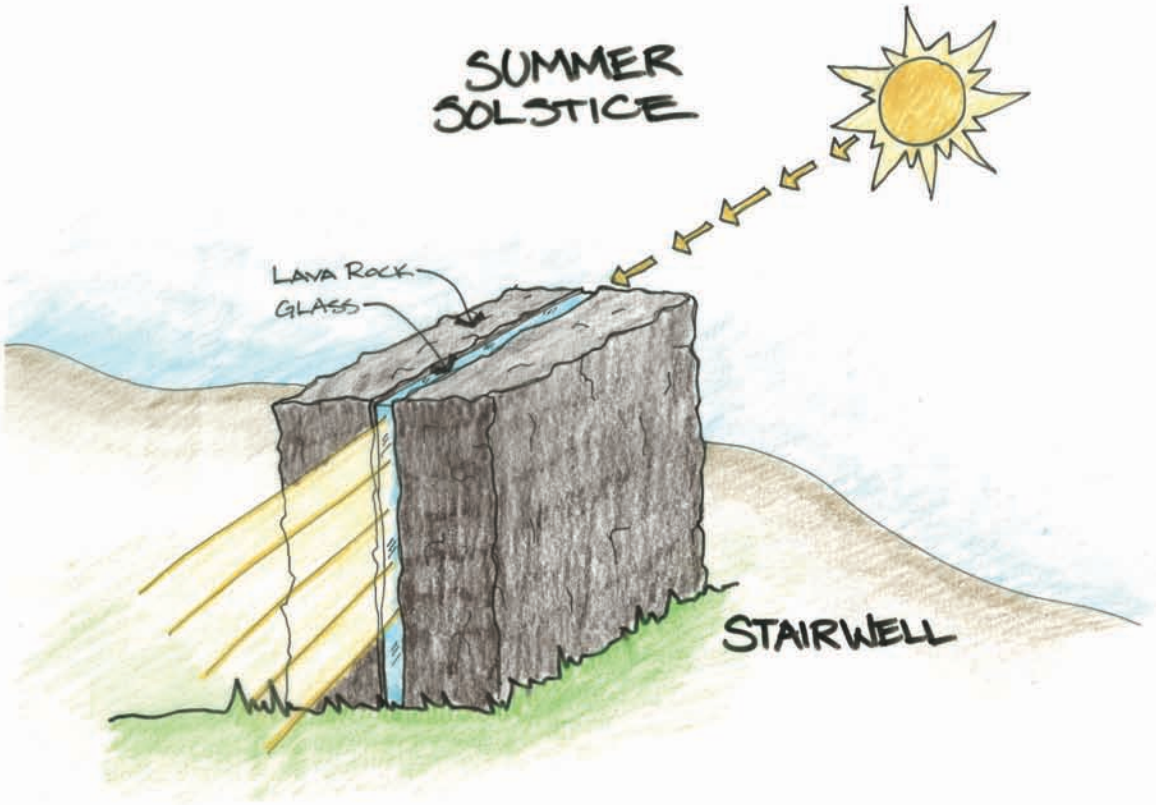
9.4.8 Featuring Cultural Event

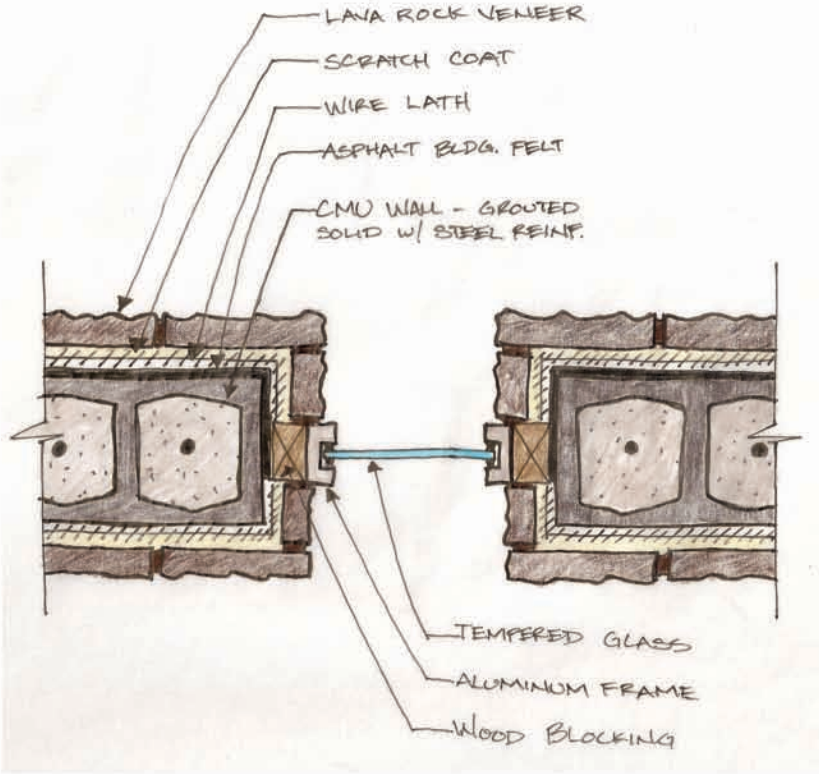
The importance of celestial events has been incorporated into this high school in both the site planning and building planning aspects of the design. Because astronomy is so significant to the culture, it was appropriate that this aspect also be featured in a more detailed level within the project. The sun and stars are important to the daily routine of traditional culture, but there are also specific events that carry great significance. Some of these events include the solstices and equinoxes of the sun.

An example of how these events can be featured has been designed in this high school. The classroom pods are already oriented towards the solstices, and one of the stair towers has been detailed to enhance this relationship. A narrow glass slit bisects the entire lava rock tower that is in perfect alignment with the summer solstice. This slit will always be a source of ambient light for the stair tower, but on the day of the summer solstice, the sun's light will shine directly through the narrow window, through the stair tower, and out the other side. This will be an event that only takes places one day a year and will bring attention to this significant cultural event.

The basic structural element of the wall is concrete masonry units (CMU). It then has a lava rock veneer to give the appearance of a lava rock structure. This is done because CMU has a much greater structural capacity than lava rock and is much easier to construct. The glass opening is then framed with aluminum, narrowly spaced to create the narrow glass opening which runs around the entire stair tower.

(see diagrams on following two pages)


SUMMER
SOLSTICE
LAVA ROCK
GLASS
STAIRWELL

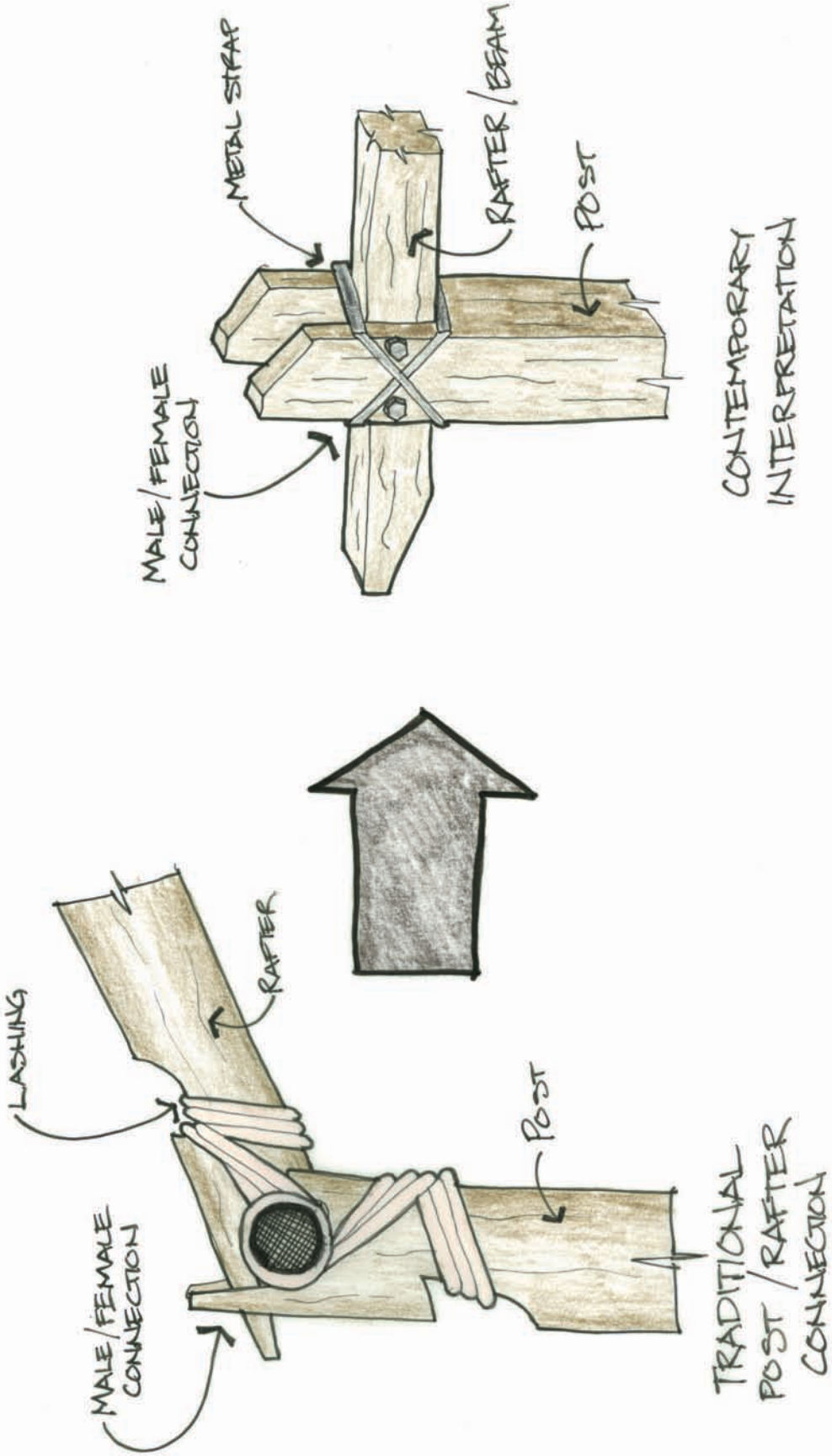

LAVA ROCK VENEER
SCRATCH COAT
WIRE LATH
ASPHALT BLDG. FELT
CMU WALL - GROUTED
SOLID W/ STEEL REINF.
TEMPERED GLASS
ALUMINUM FRAME
WOOD BLOCKING

9.4.9 Representative Construction Details

Because this project is about the design of buildings, it is important that the high school also represent some of the traditional building elements. Rather than randomly deciding upon a traditional building element to represent, it was decided that one of the more unique elements be represented in a contemporary manner. Representing unique elements is a way of evoking emotion, as uniqueness is typically a source of pride. As discussed in the cultural research, the method of joining posts in a Hawaiian *hale* was very unique amongst other Polynesian cultures, so this is the element that has been chosen as an example.

The post and beam connection detail that is found in all of the trellises in the classroom pods has been designed to reflect the traditional detail. The contemporary version uses a male-female connection just like the traditional version. It also uses metal strapping to represent the lashing element of the joining system. As a whole, the joint is an obvious representation of this traditional element of a *hale*, but designed in a way that makes sense with contemporary materials and construction techniques.

(see diagram on following page)


METAL STRAP
RAFTER / BEAM
POST
MALE / FEMALE CONNECTION
CONTEMPORARY INTERPRETATION
LASHING
RAFTER
POST
MALE / FEMALE CONNECTION
TRADITIONAL POST / RAFTER CONNECTION

9.5 Design Implementation Conclusion

The purpose of the design portion of this project is to demonstrate the effectiveness of the Cultural Design Methodology. The high school design for the Makaha and Wai'anae school complexes which has been presented is not intended to be a "finished" design, rather a starting point for further development. The elements that have been shown are examples of how the Cultural Design Methodology can be applied in developing the site utilization, creating spatial plans for individual buildings, and designing specific elements and features of the project, while at the same time still maintaining functional relevance for that particular building type based upon current trends in the industry. It is intended that as a whole, the examples shown demonstrate how contemporary design can be used as a tool for cultural preservation.

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